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ESSAY ON VEGETABLE PHYSIOLOGY.

(Concluded from page 626.)

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CHAP. XXIII.

REMARKS ON THE APPLICATION OF SCIENTIFIC PRINCIPLES TO PRACTICAL PURPOSES. PROPER CHARACTER OF EXPERIMEMTS. SOME EXAMPLES.

In the preceding chapters of this essay, I have endeavored to set before the reader, the principles of vegetable physiology, together with the evidence on which they rest; and occasionally I have mentioned such practical applications of those principles to agriculture and the various concerns of rural economy, as frequent trial has placed beyond question. Whilst preparing this essay for the public, many other practical applications have suggested themselves to my mind, but I have purposely passed them by, lest some error, which a better knowledge of practical agriculture than that which I possess would at once detect, should bring the whole into discredit. In attempting to apply a scientific principle to any practical purpose, there are always many circumstances to be taken into account; and if the person attempting so to apply it fails properly to consider each and every one of these, he will necessarily subject himself to entire failure in the result. Many of these circumstances may be such as are known only to practical men; more especially is this likely to be the fact with respect to a science, which like that of agriculture, is yet in its infancy. If the attempt to apply the principle should result in failure, many persons, not discerning the true source of that failure, will call the principle in question, or perhaps will look upon it as conclusive proof of the uselessness of science, and confirm themselves in the belief of the common sentiment "a grain of experience is worth a ton of theory," understanding by the term theory, scientific knowledge in general. If I mistake not, a great deal of that invidious distinction which is sometimes made between scientific and practical men arises from this very source.

In order that we may see more clearly the true cause of such failures, and may learn what is the inference which may properly be drawn from them, I will mention an example. Sir H. Davy some years since, discovered that a sheet of copper when exposed to sea water, might be effectually protected from corrosion, by soldering to it a small piece of zinc. This was a necessary result from the nature of galvanic action. At once he concluded, and the conclusion seemed a very natural one, that this discovery would admit of a most valuable practical application, in the preservation of the copper sheathing of ships. A trial was made; the sheathing of a ship fitting out for a long voyage was prepared under his direction. When this ship returned from the voyage, and her bottom was examined, it was found that her sheathing was indeed safe, but that it was covered in many places to the depth of more than a foot, with sea-weed and marine molluscæ, and that these, by rendering her bottom rough and ragged, had retarded her sailing so much, that more money was lost in time and the wages of her crew, than was gained in her protected sheathing. Whilst her coppered bottom was exposed to the free action of sea water, it was continually covered with a poisonous coating consisting of the corroded metal, which prevented sea-weed and molluscæ from fastening themselves to it; but so soon as this poisonous matter was prevented from forming, they fastened themselves to the copper with as much, and even greater freedom, than they would have done to a rock or log of wood in similar circumstances. In this instance the failure resulted entirely from not taking this last circumstance into account. Perhaps, had Davy consulted some practical seamen, they might have suggested this difficulty. The principle in accordance with which he acted, was a correct one, and his failure in no way affected the evidence of its truth; and further, this principle may yet be applied to the very purpose to which he attempted to apply it; if some cheap poisonous substance can be found which may take the place of the poison afforded by the corrosion of the metal, or if by any other means, marine molluscæ can be prevented from fastening themselves to the sheathing of ships, and the very failure of Davy may be directly instrumental in leading to some discovery which will accomplish the thing sought; and yet doubtless this failure has been set down by many to the discredit of science.

Lest I should fall into such errors as this, and thus bring discredit upon a study which I believe would contribute more to the advancement of agriculture, (if practical agriculturists would acquaint themselves with it, and make a proper use of their knowledge,) than almost any other which could be mentioned, I have contented myself with giving a simple statement of the principles of vegetable physiology, and purposely avoided attempting to apply them to practical agriculture, excepting in those cases where trial has been already made, and the results have proved satisfactory. In such circumstances, I hope I shall not be thought to be needlessly transgressing the proper limits of my subject, in devoting the present chapter to some general remarks upon the application of scientific knowledge to practical purposes, and the proper character of experiments.

Experimenting has been significantly termed by Lord Bacon, "asking questions of nature." Nature, in all circumstances, is subject to certain fixed and invariable laws. Our world is not a mere chance production which has happened to be what it now is; but in every part is contrived with the greatest wisdom and put together with consummate skill. The only proper object of experimental research is to ascertain these laws, in order that, acting in accordance with them, we may

render nature subservient to our will. To attain this end we must be guided by reason in the matter, and not experiment at random; or to carry out Lord Bacon's figure, we should address to nature a definite question, and not speak without reference to the meaning of the language used. It is at this point that science may render us assistance of the most important kind, and this in several ways.

In the first place, a thorough acquaintance with science will save us from spending our time in learning, by the slow and laborious process of experimenting, that which others have learned before us, and left on record for our instruction. How often is it the case, that men of great acuteness, appreciating fully the value of the information to be derived from experimenting, and who might have added much to the stock of human knowledge had their efforts been properly directed, waste their time in learning a second time that which was known long before; and how frequently do we hear of great discoveries, discoveries which are to prove of incalculable benefit to mankind, and which the discoverer honestly believes are now for the first time brought to light, when in fact they have formed a part of human knowledge for many years. In such cases, the experimenter not only loses his labor, but is often mortified, and discouraged from making any further attempts to increase his knowledge of nature. There is but one way to avoid this, and that is to make ourselves fully acquainted with that which is already known. And here let me remark, that true science is not something different from human knowledge; it is in fact nothing more than that very knowledge arranged in such a manner as to be easily acquired, and easily retained. The application of scientific principles to practical purposes, is the very best test of their truth; if they will not stand this test, they form no part of true science, but "of science falsely so called."

In the second place, a thorough acquaintance with science, by drawing a distinct outline between that which is known and that which is unknown, will direct our attention to those points which may most profitably be made subjects of experimental research. It is a remark of one of the ancient philosophers, that the first step towards true wisdom is to know our own ignorance. If this remark is a just one with respect to human knowledge in general, it is peculiarly so with respect to natural science; and no more important work can possibly be accomplished, none which will tend more directly to man's advancement in knowledge, than that which, by placing before him the sum of that which he does know, and carefully distinguishing it from that of which he is still ignorant, shall thus direct his attention to those subjects which may properly and profitably be made subjects of inquiry; and this can be accomplished in no other way so well as by having our knowledge generalized, and presented in the form of scientific principles.

In the third place, a thorough acquaintance with science will assist us, by presenting distinctly before us all those causes which may affect the result which we desire to obtain, and in this way direct us as to the manner in which we shall prosecute our inquiries. There is no portion of matter which is not subject to many laws at the same time; all the different parts of nature are bound together, and interwoven with each other; and on this account an effect may appear to spring from some certain cause, when in fact it springs from an entirely different one. Some of the most common of those errors into which experimental inquirers fall, are those which consist in attributing results to other than the true causes; and so intimate is the connexion which exists between the different parts of nature, that these errors are often of a very complicated character. For example; when the smoke which issues from a chimney is seen to sink towards the earth, we are commonly told, that the air is so heavy that it presses it down; and as evidence that this is the true solution, we are asked if we cannot feel the oppressive weight of the air resting upon our own bodies. In accordance with the principles of philosophy, increase in the density of the air should cause the smoke to rise more rapidly than usual, and not to sink towards the earth; so that in truth, the sinking of the smoke is conclusive proof that the air is specifically lighter than usual. How then can we account for the oppressive feeling of which we are certainly conscious at such times? By a reference to the principles of animal physiology, we learn that in a healthy condition of the human system, a large quantity of fluid matter is continually carried off by insensible perspiration, and that whenever this is checked, a feeling of oppression and languor pervades the whole man. The rate of perspiration, or evaporation, (for it amounts to the same thing in this case, as the one is dependent upon the other,) is materially affected by the dryness or dampness of the atmosphere. That the air should be damper than usual, and at the same time specifically lighter, are two things perfectly consistent with each other, inasmuch as the expansion from heat may be more than sufficient to counterbalance the increased density which would result from the presence of an increased quantity of aqueous vapor in the air. Here then we have a correct solution of the matter, but one directly opposed to the common one. When the smoke, as it issues from a chimney, sinks instead of rising, it does so because the atmosphere is specifically lighter than usual; whilst the feeling of oppression and languor, of which we are conscious in such circumstances, has nothing to do with the density of the atmosphere, but arises entirely from the check which is given to the insensible perspiration, by the presence of an increased quantity of aqueous vapor in the atmosphere. From such errors as these, a thorough acquaintance with science will save us, by setting before us, at one view, all the causes which can be concerned in producing any given result, and at the same time enabling us to assign to each its probable amount of influence.

With respect to experiments, the only remark which I will make is, that they should generally be conducted upon a small scale. By pursuing this course, we are enabled to gain the requisite information without risking any large amount of labor or expense of any kind; and besides, are enabled to attend more carefully to the experiment, and more accurately to observe it in every stage of its progress. If any particular method of culture succeeds well with ten square yards of wheat, for instance, as the laws of nature are uniform, the same method of cultivation will succeed equally well with ten square miles of the same grain.

From this view of the case, we will at once see the error of the opinion so often expressed, that private farmers cannot afford to make experiments; an opinion which has had a very great influence in retarding the progress of agricultural science. It is not necessary, in order to try an experiment, that a farmer should risk his whole crop, or even any considerable part of it; it is far better that he should not that he should experiment on so small a scale that total failure cannot seriously affect him.

Having made these general remarks upon the application of scientific principles to practical purposes, I will now attempt to illustrate them, in one or two cases more immediately connected with agriculture.

In one of the back numbers of the Register, the question is asked, "what is the proper distance at which to place hills of corn from each other," and in connection with this question, the statement is made that, "the results of experiments are discordant," and that "no satisfactory answer has as yet ever been given." In attempting to settle such a matter as this by experiment, there are several circumstances to be taken into account. The most important are, 1st., that a plant in order to to thrive, and more especially to mature its seed well, should be open to the action of air and sunlight, and 2nd., that adjacent plants should not be compelled to draw their nourishment from the same portion of soil. The reason for each of these directions have been given in previous chapters of this essay. Bearing these things in mind, we will at once see why experiments have given discordant results, and why no satisfactory general answer has been given to the question proposed, or can ever be given. The corn cultivated in different parts of this country is not all of the same species, and the different species differ from each other in their height, in the size of their stalks, in the number and size of their leaves, &c. If we have two species of corn, one of which grows twice as high as the other, in order that they may enjoy an equal amount of sunshine throughout their whole length, and for an equal portion of the day, the taller species must be planted nearly twice as far apart as the shorter one. Then again, soils differ much from each other in their texture; some are mellow and deep, whilst others are light, and rest upon a stiff sub-soil. Plant the same species of corn in each of these soils, and from the manner in which the root grows, it will be at once apparent, that in the first, the tendency will be to strike its roots down, whilst in the other, there will be an equal tendency to spread them out near the surface. The roots of two adjacent plants, if we suppose those roots to be of the same length, must run together much sooner in the one case than in the other. The proper distance at which adjacent hills of corn should be placed from each other will depend upon both the particular species of corn cultivated, and the nature of the soil in which it grows, and in performing any experiments which shall afford valuable information respecting the matter in question, both of these circumstances must be carefully noted. If this has not been done, the results of different experiments will of necessity be discordant.

In the 20th chapter of this essay, I have stated the principle, that "plants, as a general thing, resemble their parent plants, i.e. the plants from which the seed from which they sprung was obtained, in form, in texture, in the abundance richness and flavor of their fruit, in their liability to disease, and in fact in almost every particular which can affect their value to man." When this principle was stated, it was dismissed for the time, with the intention of resuming its consideration in this place. Let us see if it will admit of any practical application in agriculture.

One of the most common misfortunes which disappoints the wheat-grower's hopes in eastern Virginia, is the rust. This I believe is generally considered, a diseased condition of the stalk produced by a peculiar condition of the atmosphere. If it be true that this disease is owing entirely to the influence of the atmosphere, then any attempt to remedy it must be hopeless. But is this certainly the case? May it not be, that whilst a particular condition of the atmosphere, or a particular kind of weather, is the immediate cause of its developement, a predisposition to the disease exists in the plant itself? And may not this predisposition to the disease be of a hereditary character? The fact that the rust is now more common than it was formerly, seems to favor such a supposition. If such should be the case, then the most effectual means of preventing the disease, would be to provide seed-wheat from a stock which had never been affected with the rust.

There is a striking similarity in all these particulars, between plants and animals. We know that in the case of man, certain diseases, or rather, to state the case more accurately, a predisposition to certain diseases, is transmitted from parent to child, whilst the immediate cause of the disease, in each particular case, is entirely of an adventi tious character. The consumption is of this character. If we place two children of the same consumptive parent, children, so far as we can see, equally predisposed to that disease, the one in favorable circumstances for its developement, and the other in unfavorable circumstances, the one will die, whilst the other will survive. Or if we take two children of different parents, one of whom has inherited a predisposition to consumption, whilst the other has inherited a sound constitution, and place them both in circumstances favorable to the development of that disease, the one will die, whilst the other will live to a good old age. So far as we can see, the same law obtains in the vegetable as in the animal kingdom in this particular; at any rate, such is the conclusion to which observation and experiment would lead us. Why may not the rust be a disease of this character; depending for its development upon a particular condition of the atmosphere, but the predisposition to which, is deep seated in the very constitution of the plant? I do not mean to assert that such is the case, for I am not sufficiently acquainted with the fact of the case, to make up a decided opinion, though all the facts with which I am acquainted would favor this view of the matter. I mean simply to suggest the question, and in case those better acquainted with the matter should think that this is the fact, to point out the proper remedy.

Again; "plants as a general thing resemble their parent plants in the richness and abundance of their seed and fruit, as also in the time of ripening that seed." Some years since I tried an experiment to ascertain to what extent this was true.

At the time, I made no notes of the experiment, and of course cannot be perfectly acurate in my statements; but yet I shall not vary far from the truth. The plant on which the experiment was tried, was the species of bean called in Thorburn's catalogue, "refugee or thousand-to-one bean," an excellent species of snap. Having selected a row of beans at the time when they were first setting, on one half of the row, I suffered those pods which set first to ripen, carefully removing those which set afterwards; on the other half of the row, I removed all the first pods as fast as they set, leaving none but two or three of the last that set to ripen. When fully ripe, the two varieties were gathered and carefully kept seperate from each other. The next spring I planted both varieties at the same time, and side by side, but no two different species of beans could have differed more from each other than these did. The first variety were fit for use at least three weeks before the others; the plants of the first were low and stiff, whilst those of the other were tall and slender, in one or two instances having something the appearance of vines; the beans when ripe differed in shape, size, and even in color; those of the early variety being pink, whilst those of the late variety were deep purple. But the greatest difference was in the amount of the yield, the early variety averaging from 6 to 10 pods to each plant, whilst the other variety averaged, I think, at least from 30 to 40. And yet each variety preserved the original characteristic of the refugee bean, viz. that of having a tender pod, and thus affording a good snap bean. Had not circumstances prevented, I should have pursued this experiment, and from the results which I did obtain, I have no doubt, that in the course of a few years I should have obtained two entirely distinct varieties, one of which would have afforded the earliest snap bean which could be raised, though its yield would have been by no means abundant, and this, by the way, is the fact with respect to every variety of early beans and peas that I have ever seen, whilst the other would have afforded a late snap, and yielded most abundantly. Just how far other plants might be affected by a similar treatment I am unable to say; but if the general principle which I have stated be correct, and it is a principle based upon the results of many experiments, performed on many different kinds of plants, and by many different experiments, every plant will be affected to a greater or less extent, and doubtless all to such an extent as to materially affect their value. Very often, the seed of early and late varieties, or of some prolific variety of a plant, is obtained from a distant part of the country, with great trouble and at great expense, and after all, is found not to succeed well in our climate; would it not be a much easier and in every respect a much better plan, to select some variety which possesses all the qualities excepting those of being prolific early or late, and then obtain varieties which shall be what we wish them in this respect, by such means as those referred to above? I know that some farmers have given a certain amount of attention to this matter, but I doubt whether those who have given most attention to it, have ever pursued the matter as far as it might profitably be pursued. The results have in every instance been of the most desirable kind, and this method seems to be one of the easiest and most certain methods of improvement open to the agriculturist; why then should the matter be suffered to rest where it does!

In order to bring the subject of selecting seed with great care, because the offspring will partake of the character of the seed from which it springs, and also to point out some of the precautions to be observed in order to do this successfully, let me refer to a fact stated in one of the back numbers of the Register. In the No. for Oct. 1838, there is the following article.

"Many years ago, a farmer in this quarter, who cultivated the same variety of wheat and in the same manner as did his neighbors, was known to have a yield of a third more to the acre. Upon inquiring as to the cause, the unsatisfactory answer was given—"I sow barrel seed." The neighbors purchased of him their seed wheat, and the first year had a yield equal to his, but selecting their seed as formerly, the second and third crops were but little if any better, than was raised by them previous to their purchase of seed. They again purchased, and their fourth crop was equal to the first, but their fifth and sixth crops, were like their second and third. How to solve this apparent mystery, caused many a neighborhood consultation and discussion. The vender of the seed saw too inviting a prospect to make money from the sale of seed wheat to induce him to disclose the manner of its preparation, and he struggled to keep it concealed. It was ultimately discovered however, and was as follows. When you are ready to get out your wheat, place a barrel or box in your stack-yard, open at one end, before you pass the bundle to the treading floor, give it one or two strokes a cross the open end of the barrel or box, by which the best matured grains will be shattered off, then winnow and used for seed. Thus prepared it will be far superior to the seed prepared by running it through a coarse sieve, for it is known to every observant farmer, that many of the largest grains of both wheat and rye are unripe or diseased, and yet they do not shatter out as easily as those which are perfectly ripe."

Taking these statements as true, and I see no reason to doubt their correctness, let us see what a careful attention to this matter will be worth to the wheat grower, counted in dollars and cents. Seed wheat selected in this way would cost him nothing more than the price of the labor necessary to strike the bundles upon the barrel, before passing them to the thrashing machine, above the price of as much wheat measured without any selection from his whole crop. Let us put this at 10 dollars, and this I am certain is five times as much as it would cost. If his ordinary crop is 1000 bushels, by pursuing this plan, with the same amount of labor and from the same quantity of land, he will obtain 1333⅓ bushels. Estimating this at $1 per bushel, the market price as given in the last number of the Register, we have

Crop by improved cultivation worth	$1333⅓
Crop by ordinary cultivation worth	1000
Gain	333⅓
Deducting price of labor in selecting seed - - - -	10
Clear gain	$ 323⅓

If his ordinary crop is one of 5000 bushels, his clear gain will of course be 1616⅔ dollars. About this calculation there can be no error, if the data

on which it is founded be correct; for these of course I am not answerable, I take them as I find them stated by a practical farmer, and I see no reason to doubt their correctness. Is not this matter then worthy of the attention of farmers?

It would be easy, did it seem desirable, to multiply instances of the application of the principles, stated in the preceding chapters of this essay, to practical purposes; but having stated the principles themselves, together with the evidence on which they rest, I now leave it with those farmers who may have given the essay a careful perusal, to make the applications for themselves. If by what I have written, I shall have given any information to my readers, or if I shall have only called attention to that which they knew before, but which they suffered to be amongst their neglected knowledge, and in this way shall have contributed in any degree to the advancement of the cause of scientific agriculture, I shall feel that I have not written in vain. And in conclusion, let me remark, that whilst it is beyond a question, that the prosperity of this "our good old commonwealth" is indissolubly connected with the prosperity of her agriculture, at the same time it is true, that our systems of agriculture are far from what they ought to be, and far from what they will become, when once attention is thoroughly awakened to the subject.

URATE AND POUDRETTE.

From the New England Farmer.

New York, 21*st. Sept.*, 1839.

SIR—The New York Urate and Poudrette Co., finding that gentlemen who had purchased their manures had been experimenting with the articles, some advisedly and others mistakenly, it became desirable for many reasons to learn—

1—On what particular grains or garden vegetables the manure was used, the quantity applied, and the result:

2—To know the precise manner and result of each trial:

3—How the urate and poudrette compare with other manures in their effect, and

4—Generally, whether it was not desirable to the farmer and gardener to have the contents of sinks and privies made into *inodorous* manures.

In answer to their circular sent to Mr. Linn, of Schenectady, they have received a letter of so interesting a character, that we ask the publication of it at as early a day as your arrangements and convenience will permit.

Amended instructions, the result of information received, will be published in a few days for *gratuitous distribution* among those who have or may wish to use the manures.

(COPY.)

Schenectady, Sept. 19, 1839.

The New York Urate and Poudrette Company.

GENTLEMEN—In answer to your "circular," I would say, that I obtained from your company a barrel of poudrette last spring, intending to test its value as a manure, by a few close and accurate experiments. It came to hand, however, so late in the season, that I was unable to apply it as I intended, or to arrive at results which would in all respects prove the value of the substance as a manure, or the best modes of applying it. I applied it to a variety of vegetables in my garden, and also to a small portion of a field of corn of about five acres, at my farm in the vicinity of this city. The vegetables in my garden have grown with unusual richness and luxuriance, and have most evidently felt the effects of the application. Of the results at my farm I can speak more satisfactorily, because there I can compare the portion which *has*, with another portion of the same crop, in the same field, which *has not* received the poudrette. This crop is upon a strong, rich soil, which had been slightly manured in the hill from the fold-yard at the time of planting. At the first hoeing, and when the plants by reason of the unfavorable season were extremely backward, I directed my farmer to apply to a corner of the field, where the crop was the least promising, a handful of poudrette to each hill, covering it at the same time with a thin coat of earth. This was faithfully done until the poudrette was consumed. The remainder of the field received, a part the usual dressing of *plaster*, and a part of *ashes*. The plants to which the poudrette was applied, were the first to change color—throwing off the sickly, yellow hue, and adopting a deep green. At the period of the second hoeing, the same plants retained not only the appearance of better health, but had obtained greater vigor and more size than any others of the same crop. They have held the same distinction throughout the season; and it is now plainly visible, although the entire crop is a fair one, that when we come to harvest, we shall gather a greater weight of stalks and more grain from the portion where this manure was applied, than from the same space at any other point in the field. We have certainly no experience proving that the same results could have been reasonably expected from the application of any other of the various manures in common use.

With us, plaster has long been considered the grand restorative for this crop, and ashes, with many farmers, almost a specific; and indeed that both substances are very useful as manures on most varieties of soil, is universally conceded. Mills to grind plaster for manuring purposes, are as common throughout this part of the country as those devoted to grain; and I have seen boats loaded with leeched ashes, toiling their way from the far west, in order to enrich farms on Long Island.

In this experiment, poudrette was applied side by side with plaster and ashes, under circumstances in favor of the latter, and yet they have most indisputably yielded the palm to the former; and all this is not without reason. *Heat* and *moisture* are the sources of vegetation: poudrette, if it have *it* not in itself, will generate more heat, and for a longer period, than either plaster or ashes, and will absorb and retain more moisture. It seems, also, to decompose inanimate vegetable substances in the soil with which it is mixed, and so to diffuse and incorporate itself with the soil as to change its color around the plant to which it is applied. Like most other manures, (only more sensibly and rapidly,) it imparts of its qualities to every substance with which it comes in contact, and by the aid of its own and borrowed heat and moisture, assimilates all to itself and thus exercises, although applied in most inconsiderable quantities, a certain and immediate influence on vegetation.

I regret that I did not receive the article so as to apply it at the time of planting. I am not sure that the results would have been more successful, and except for the purposes of experiment, I should be content to use it hereafter on most crops, as I have done this season.

Desiccated manures have long been appreciated in Europe. There, one ton of them have been estimated to be equal in fertilizing properties to thirty-six tons of barn-yard manure. At this rate, there is a large balance on the score of economy in favor of the former: and when it is remembered that the manures, as prepared by your company, are wholly inodorous, and may be conveyed in barrels to the most remote parts of the country as commodiously as flour, and at a trifling expense, our agriculturalists should be moved by every consideration connected with cleanliness, rural economy, the productiveness of the soil, and the right use of the means which providence places before them as incitements to industry, to promote the use of substances, which, left undisturbed, are worse than useless—scattering in our large cities and towns disease and death, and which, when submitted to your *alchymy*, spreads health and verdure, and blesses and rewards both citizen and husbandman.

I shall be pleased to receive your "improved instructions" for using the manures, of which you speak, and to know at how early a day this fall I may order a few barrels* for future experiments.

Very respectfully, yours, &c.

A. L. Linn.

The following is a copy of the improved instructions alluded to in the foregoing:

Manures.

The attention of the public has recently been directed to the use of urate and poudrette. It has long been known in France as the most efficacious of all manures, and the experiments made during the past and the present year, viz: 1838 and 1839, in the use of poudrette in the northern and eastern states, but more especially in and around the city of New York, have awakened the attention of both farmers and gardeners. The Royal Academy of Agriculture in England, have caused experiments to be made of the respective power of the different manures, and upon trials so made, it appears beyond a doubt that manure made from sinks and privies, is superior to any other productive agent for agricultural purposes. Is it necessary to add, that it is worse than labor lost, to cultivate worn out or poor soils without the use of manure? He who expects to be liberally rewarded for his labor must give liberally what nature requires. The wise man has said, "he that watereth shall be watered also himself."

Amended Directions.

Directions for their use were given by Peter Barthelemy, (who was one of the first discoverers in France of the present system of preparing the articles,) how and in what manner they should be applied, and who recently introduced their manufacture in the city of New York. Many of the persons who have used the articles, have found, from practical experiments, that the former directions may be amended advantageously, and it is doubtless the case that many new methods may be discovered, which it is hoped will be communicated for public benefit.

Urate is the product of the *liquid* part, and poudrette of the *substantial* part of the sinks or privies, both of them reduced, by a different process, to a dry and inodorus substance, and used as the best of all manures known to agriculturalists and horticulturalists, being an animal manure of the richest and purest kind, and the most powerful of any application that can be made to the earth.

Urate.—The urate may be used in its dry state by spreading it on the land as you would lime or ashes, or, after having been dissolved in water, may be used through a watering pot, or by a cask on cart wheels, in the same manner as the streets in the city of New York are watered in summer.

For all kinds of small grains, such as wheat, rye, oats, barley, flax, and others of the like kind, it may be sowed dry upon the soil, in the proportion of 12 to 18 bushels per acre, according to the quality of the land, and then harrowed in.

For corn and potatoes, and such like, it is best to mix the urate in an equal quantity of dry soil, and put in the hill about a gill or handful, sprinkled around the seed corn and potatoes as is usually done with ashes.

For beets, turnips, or other vegetables sowed or planted in drill, the urate is to be prepared in like manner and sowed in the drill.

For grape vines, fruit trees, flowering trees, flowers, also for garden vegetables, such as cauliflower, cabbage, melons, cucumbers and the like, urate may be dissolved in water, in the proportion of one pound to a gallon of water, and poured on the subject; one application is sufficient; and for articles not herein enumerated, it may be sowed dry on the surface of the ground.

Where the land retains water during the winter, urate must be used only in the spring, in order that its salts may not be absorbed in too large a quantity of water.

Where the land is dry or does not retain water during the winter, urate may be used in the autumn—if, however, the sowing takes place shortly before the hard frosts, it is better to use urate only in the beginning of spring.

As a general rule, more urate is required upon the same quantity and quality of land in autumn than in the spring; if used in the spring, it is better to apply the urate in a damp day, or immediately after a heavy rain, if it cannot be applied shortly before the rain, as it is a light substance, liable to be blown from off the land by high winds.

There is a great advantage in soaking corn, oats, and all other grain, for twelve hours only, in a solution of urate, prepared as above directed, before planting or sowing it, and then rolled in lime or plaster, the corn or grain will start sooner, be stronger, and less liable to attack by worms or birds: but care should be taken not to suffer it to remain longer than about twelve hours in the solution, else you might destroy the germinating quality of the grain. It has also been found beneficial to soak timothy and clover seed in urate or poudrette for about four to six hours, and then rolled in lime or plaster, the seed comes up better

* The company have several thousand bushels for sale at the present time.

and grows stronger than other seed sown at the same time in the same field.

Poudrette.—Poudrette is not dissolved in water before being used, as is urate, but it is to be used in a dry state, or by mixing it with dry soil in hills or drills, or sown in broad-cast on the land, as you would lime or ashes. Experiments in this country, thus far, have proved the following methods as the most advisable in its application:

For Corn.—After the furrows have been struck, sprinkle in the place where the hill is to be, before planting, a handful of poudrette, equal to about a gill, then deposite the corn, (double that quantity of poudrette has destroyed corn and burnt it up,) then cover up the corn and press the earth down over it with the foot or hoe.

For Potatoes.—The same quantity, namely a handful or gill, may be used very advantageously; and it has so happened, that when the quantity was increased nearly double, no injury resulted, but rather improved the potatoes: a large handful, however, is sufficient.

Compost.—It is worse than useless to attempt to make compost by mixing urate or poudrette with any thing but dry soil; if mixed with other manures, they operate on the other manures until those manures are consumed, before they are beneficial to plants; and in some instances it may be, that the results of the use of the urate and poudrette in the *first* year of their *first* application, will not be as satisfactory to the farmer as he will think he had a right to expect; this arises from the fact that the land contains a considerable quantity of some former manure upon which urate and poudrette will first act; at the very next season, however, the farmer will find a crop far superior to his expectation, provided he will put no new manure of any description to the land lately manured with urate or poudrette.

This, however, must be further explained by saying, that it applies to manure placed or dunged in the hill, or where the land is in a high state of cultivation, from having been highly manured in broad-cast, which would give the poudrette an opportunity of feeding upon or consuming it. Experience has proved, this year, that where there was a moderate application of lime, or barn-yard manure applied to the land in broad-cast, it did not appear to affect the influence of the poudrette on the crop.

The quantity of poudrette must vary from 15 to 35 bushels per acre according to the quantity of the land, and the crop cultivated: less than 15 bushels to the acre may not be very satisfactory, and more than 35 is useless.

On Long Island, the following has been adopted by a practical farmer with success. For wheat, he used to apply 20 wagon loads of 30 bushels each, equal to 600 bushels of horse manure, which cost him $20, besides carting 20 loads. He now applied 40 bushels of poudrette which cost him $16, and can carry more than sufficient for one acre in a load.

For rye, 450 bushels of horse manure, and now 25 bushels of poudrette.

For oats, 350 bushels of horse manure, and now 20 of poudrette.

For buckwheat, 200 bushels of horse manure, and now 15 of poudrette.

Indian corn, one gill in the hill.

Urate and poudrette are light substances, and liable to be blown off the ground by high winds, if sowed on the surface when the ground is not damp; therefore, it is considered best to sow the grain and harrow the land once, and then sow the manure in broad-cast and cross harrow the land the second time.

The difference of the season between spring and autumn, and the state of the atmosphere, are to be considered before using either urate or poudrette; damp weather is always to be preferred. Neither of them contain any seed of weeds of any description. An application of 35 bushels to the acre of urate or poudrette once in every three years is sufficient.

Urate and poudrette may be sent to any part of the country in barrels or bags—barrels are to be preferred when it is liable to get wet. Orders may be given, post-paid, directed to "*The New York Urate and Poudrette Company*," box No. 1211, post office, New York.

ANCIENT AND PRESENT AGRICULTURAL CONDITIONS OF THE HOLY LAND.

Extract from Addison's 'Sketches of Jerusalem.'

Hecatæus, a Greek historian, who flourished 549 years B. C., speaks of the great fertility of the land belonging to the Jews; and Polybius, B. C. 170, states that the eastern part of the country, about Tyre, furnished abundant supplies to the army of Antiochus. Diodorus describes the inhabitants, fifty years B. C., as generally living upon flesh and milk; he speaks also of the pepper which was produced upon the trees, and of the abundance of honey which, according to a later historian, the country people used as a beverage, mixing it with water.* Pliny also celebrates the palm trees, and the oil and the balsam; and other writers enthusiastically speak of the land as "the fortunate country," "the country abounding in pasture."†

They describe the two Galilees as covered with all sorts of trees, and the soil as everywhere so rich and fertile, that the most lazy were encouraged to cultivate it from its fruitfulness. Samaria is celebrated for its kind and genial soil, its sweet waters, its abundance of trees, fruit, and cattle, and also for the delicious milk it produced, in consequence of the quantity of grass. Gennessareth, too, is spoken of as a delightful region, in which all kinds of trees flourished, the nut, the palm, the fig, the olive, and the vine; and the valley of the Jordan has been widely celebrated as "a garden environed with hills," "a celestial region," delightful for its trees, fruits, and odoriferous balsam.

At a subsequent period, A. D. 313, when the country had much declined from its flourishing state under the Jews, it is still celebrated by Eusebius for its oil, corn, wine, vegetables of all kinds, honey, palms, fruit trees, cattle and beasts of burthen; and later still, towards the close of the fourth century, Hieronymus a native of Palestine, observes "That the celebrated land of Judea excels all land in fertility, no one can doubt, who hath marked well the country from Rhinocorura to Mount Taurus and the river Euphrates, the power of the cities, and the pleasantness of the climate."

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* Ammianus Marcellinus, lib. ix. c. 104.

† Josephus. Tacitus. Ammianus Marcellinus.

A faithful description of the state and appearance of the land at this day will present a picture exactly the reverse of that sketched above. There are now no chariots of iron nor of wood, nor carriages of any description, not even carts upon wheels, throughout the country. There is no such thing either as a carriage road, or any made road at all. In the mountains and rocky districts, the marks of horses' hoofs worn into the surface of the hard stone alone point out to the traveller the direction of his rout; and in the plains, the devious tracks and bridle-paths, except where the vegetation is strong and vigorous, are entirely obliterated after high winds and heavy rains, and the course of the traveller is then entirely directed by some bold mountain or well-known eminence.

Instead of the country covered with all sorts of trees, and the genial soil refreshed with sweet waters, and clothed with an abundance of grass, the eye now wanders either across wide and cheerless plains, parched and dusty, and unrefreshed by one single solitary tree, or across rugged and desolate districts of naked rock and loose shingle, where neither a drop of water nor a blade of grass is found to relieve the monotony and nakedness of the surrounding desolation. The footsteps of the traveller are ever and anon conducted across wide and fertile plains, covered with a fine black mould but except in the immediate neighborhood of a few solitary hamlets, perched by the side of a scanty rivulet, at wide distances from each other the whole surface of the soil is left neglected and totally uncultivated. During six months in the year it is covered with thistles and rank herbs; the earth is parched and cracked into wide fissures, and not a single drop of water can often be found for half a days journey, and yet the land was once described as "a land of brooks and of water, of fountains and depths, that spring out of valleys and hills."

In the winter season, when the rains fall and moisten the dry seeds which have been scattered in the dust by the ripened vegetation of the preceding summer, these wide plains begin to assume some appearance of freshness and of green; but ere the young and vigorous vegetation of the new year has well made way through the dead and rotting stalks of the preceding season, it is in its turn brought to maturity; and soon after killed and dried up by the burning rays of the summer sun. A stream of water in this thirsty country in an almost invaluable treasure, and wherever a brook refreshes the soil, there a small hamlet is found to be perched, and the water is exhausted in irrigating the adjacent land, and supporting the few radishes, turnips and other roots, which, with unleavened bread, or roasted Indian corn, constitute the food of the inhabitants.

The milk of the goat, or of the dromedary, is the only milk now procurable, and the eye searches in vain for the rich pastures, and the abundance of cattle described by the old writers. The ground in the neighborhood of the villages and towns, with one or two solitary exceptions, is cultivated only for a mere subsistence; there is no valuable produce growing on the soil, and no accumulation of wealth and capital upon the surface of the country. The vineyards are all wasted and destroyed, except here and there a vineyard belonging to the convents, and wine is nowhere to be met with, except in the houses of some of the Christians, or in the cellars of the monks. The delightful groves of all sorts of trees, so lavishly praised in times past, no longer extend their shade over the bald and naked country; and, excepting the fruit trees in the gardens of the villages, and the few olives, which at Samaria and in some other places afford an agreeable relief to the eye, the whole landscape is entirely treeless.

When we hear of the "store cities" of times past, of the "cities great and fenced up to heaven," and of the strong and populous towns with glittering towers, "*turribus in cælum nitentibus*,"* we can scarcely believe that this thinly peopled, poor, and solitary country can be the one so celebrated by ancient writers. Excepting the icy regions of the north, the wild deserts of Syria, and the vast stony and sandy plains of Africa and Arabia, there can scarcely be a more solitary, deserted, and poverty stricken country in the old world, than Palestine as it now exists. From Damascus to Gaza, a journey of a fortnight, Jerusalem, Naplous, and Jaffa, can alone be said to maintain the rank of towns Nazareth, Tiberias, and D'jenneen are no more than large villages of mud houses; and Tyre and Sidon, and the sea-ports, destitute of wealth and commerce cannot be placed in the same rank with the most miserable fishing-town in the island of Great Britain.

The country being unenclosed and unappropriated, the right of ownership, exists in the sheikh or chief of the nearest village, as a sort of lord of the manor, who exacts a tribute, when he is strong enough to do so, from the Bedouin Arabs and wandering tribes of Turcomans, who, during their migratory excursions, feed their dromedaries and goats upon the rank herbs. In all the villages and scattered hamlets, which here and there diversify the monotonous surface of the treeless solitude, the houses are alike destitute of furniture, of even the commonest domestic utensils. The people are clothed in tattered garments, and the sickly children, with pale and bloated countenances, in many places, present a sad aspect of want and misery.

The present condition of this interesting country is most remarkable, and well worthy of deep consideration, when taken in connection with the history of the Jews, and the language of prophecy.

CONSIDERATIONS ON BUYING AND RAISING HOGS IN VIRGINIA.

To the Editor of the Farmers' Register.

If it is a fact, as some persons think, (and they say the opinion is founded on actual experiment,) "that oats do not injure land," it may be doubted with good reason, if that crop might not be made more valuable through the whole region of sandy or light lands, than the crop of wheat. It is good food for hogs, cows and sheep, and when you consider the great number of each, annually brought from the western part of Virginia, and from other states any plan for home supply should be well investigated before it is denounced as wild. The place in which you live, (Petersburg,) consumes perhaps 15,000 hogs of the average weight of 150 lbs., at six dollars a hundred, or nine dollars

* Rufus Avenius.

a hog, the annual amount paid, will be one hundred and thirty five thousand dollars. How the physical strength produced and sustained by eating all this pork is employed, I (a stranger,) do not know; but if your fellow citizens spend a proportional sum in other things, I am afraid they are in a fair way to eat off their heads. Of this sum, a very small part is left by the drovers; they some times buy a negro or a stallion, but by far the greater part is carried back to furnish the means to the country merchants, scattered throughout the whole stock country, of making remittances to the Atlantic cities. And I expect the notes are returned to our banks at least as soon as they wish to see them. Hogs that run at large can be kept in growing order on a ear of corn a day; and a quart of oats would certainly be equal to it. A little less than eleven bushels and a half, then, will give a year-old hog, weighing one hundred pounds and worth six dollars when fat; and to do that will require half a barrel of corn at the least, the value two dollars, which would make the 100 lbs. of pork cost about seven dollars. But Mr. Editor, I never raised a hog in my life, on such luxurious living. From the 20th of May until my hogs are brought to the pen, 1st November, I rarely feed them once a week, so that for five months and a half, feeding is out of the question. An acre of clover will keep in good condition, say six or eight hogs, until the first of July, at which time they begin to glean the harvest field. The feed saved during the growing season will surely fatten the hog, and 100 lbs. of pork will not cost me six dollars. This 100 lbs. of pork, if raised by one dealing in Petersburg, is spent on the spot for something or other which he thinks necessary, or his wife *could not live another day without.* These hints can only be profitable to those who live near uninclosed land and have dividing fences, or those who have good standing pastures. Suppose fifty thousand dollars of this outgoing had been saved and divided among the community trading with Petersburg annually, for the last four years, don't you think the benefit would be felt by all classes? I hope some persons better informed on this subject than I am, will give us his thoughts.

I sall resume the consideration of this subject, in a future number. J. P. BOLLING.

Amelia, Oct. 26, 1838.

MANAGEMENT OF GRASS LANDS.

(Concluded from page 636.)

2. *Pasturage.*

Much of the land of this country has never been cultivated, but produces without cultivation the herbage plants peculiar to it; such are all our mountain pastures, and the unimproved surface of the lower plains.

It is an error to apply the term waste to lands of uncultivated pastures. They are in no degree waste, but are employed in producing the species of food which, in the circumstances in which they are placed, may be the best which they are suited to produce. It may be supposed that, by cultivation they will yield a more abundant produce, but it is always a question of prudence, whether the the profit in cultivating them will be greater than that derived from them in their natural state.

A primary improvement of which lands unsuited to cultivation are suceptible, is freeing them from stagnant water. This is for the most part to be effected by affording an outlet to the water in channels cut in the most convenient places. This should never be omitted where the land is of sufficient value to repay the expenses; and it is rare when land is of sufficient fertility to produce the grasses at all, that the expense of giving an outlet to the surface water will not be repaid by the increased value of the herbage-plants produced.

A species of draining, which has been practised to a great extent in some of the mountain districts of this country, is by means of narrow drains, about a foot in depth, made by the spade alone, carried along hollows, wherever the water is likely to be interrupted. By this species of draining, an important improvement, at no great expense, has been effected in many mountain pastures; and the tendency to rot, one of the most fatal disorders to which sheep stock on wet land is liable, lessened or removed.

Another method of improving the natural pastures of an elevated country is enclosing. In this way the animals of a farm are confined to the pastures which are suited to them, and permitted to feed undisturbed. And a great improvement of all elevated pasture lands is shelter for the stock; and judicious planting, accordingly, is one of the means of increasing the value of exposed pastures.

But land is not only left in grass in parts of the country incapable of cultivation, or in cases where cultivation would not repay the charges incurred, but much even of the better land is kept in grass, when it is found that in that state it yields a more safe and steady profit than if cultivated. It is also, in all cases, a renovation of the productive powers of cultivated land to allow it to remain for a period in grass; and hence a large proportion of the whole country remains in that state.

The animals that may be pastured in all lands under grass are our different kinds of herbivorous stock. Cattle and horses require a large quantity, and, though they prefer the finer grasses, are satisfied with a coarser herbage than sheep. Hence, a rule of the farm is, to put sheep on finer and shorter grasses in preference to cattle and horses, and cattle and horses upon the larger and ranker pastures.

Whatever be the animals that are turned out to pasture, the rule is, that the pastures should never be overstocked; that is, that there shall always be a sufficient quantity of food for the animals.

When animals are kept in the fields during the months of winter, they must of necessity remain there till the herbage rises in spring. But when they are not kept throughout the winter in the field they are not usually put to the pastures in spring till these are sufficiently advanced to receive them. The usual period is April or May, when our various animals are put in their respective pasture-fields for the summer.

The benefits of freeing lands from injurious wetness have been adverted to in the case of upland pastures. They are yet greater in the case of the pastures of the the plains, inasmuch as the the relative value of the land is greater. In this case, not only should surface-water be carried away by ditches and open drains wherever necessary, but under draining should be resorted to, to free the land of wetness. By removing underwater, a more valuable species of herbage is pro-

duced, and the tendency to produce inferior plants lessened.

In the management of land kept in pasture, no manuring is required to maintain its fertility, which will be increased and not diminished by the effects of pasturing. Any species of manure, however, will add to the productiveness of land in grass; and when, from any peculiar cause, it is thought expedient to manure land in grass, the best kind of manure is usually lime or composts of earth and lime. These are simply spread upon the surface, when vegetation has become inert at the fall of the year, or before it has become vigorous in spring.

The surface of land kept in grass becomes uneven from several causes. One of these is of yearly occurrence, the labor of the mole. In spring the mole-hills should be spread regularly by the hoe or spade; and, to prevent the animals from becoming numerous, they are taken in traps.

Another creature, too, scarcely known in some parts of the country, but very troublesome in others, is the ant. The hills raised by the ant are unsightly and hurtful, and there is great difficulty in driving the little creatures from the habitation which they have so carefully constructed. The hills, forming little eminences like small hay-cocks, will sometimes cover a large part of the surface. The methods recommended for destroying the ants are, raising the sods containing them by the spade, and burning them in heaps; or, just before winter, dividing the ant hill with the spade, and laying the contents upon the surface.

The chief injury, however, which land when left long in grass is apt to sustain, is the decay of its herbage by the springing up of inferior plants. The most common of these are the *musci*, mosses.

The mosses are altogether innutritious. They occupy the place of the herbage plants, and thus render the pasturage of less value. They are most apt to grow where the soil is inferior and moist.

The best method of destroying this class of plants is by draining and liming; and old grass-land, when overgrown by these and other unproductive plants should be taken up and undergo a course of tillage.

When it is inconvenient to break up the land, or when it is wished for any good reason to retain it in grass, the improvement of the sward may be attempted without tillage, although this will be found to be more expensive and less effectual. Rakes and harrows, with close-set teeth, may be employed to pull up the mosses; but this, which is merely a palliative, leaving the cause of the production of the plants unremoved, should be accompanied with draining, when necessary, and the application of calcareous matter to the surface. A somewhat more efficient mode of improvement is, to pare off the surface with the spade to the depth of a few inches, and then, after stirring with the harrow the soil below, to replace the sod. The productive powers of old turf will be renovated by this process, and especially if any lime or calcareous manure is applied before the sod is replaced.

When land is kept in grass, weeds of various kinds may tend to occupy the ground in place of the more useful herbage. The smaller kinds of these can only be eradicated by improving the ground itself. The larger weeds, as thistles, docks, ragweed, and others, should be pulled up or cut over when they come into flower, or before it. The best instrument for the the latter purpose is a little spade, carried in the hand, by which the stem of the weed is cut at or below the surface. The scythe, too, must be used, to cut down such plants as tend to overshadow the ground; and this should always be done before they have ripened their seeds. Whins, when old must be hoed up, which is generally an unsatisfactory operation; but young whins may frequently, when the weather is moist, be pulled up by the hand. All suckers of trees, too, should be pulled up as soon as they appear.

The very detail of these circumstances, however, shows the expediency of taking up old turf for a course of tillage whenever it tends to produce injurious plants. It is in this way only that they can be thoroughly eradicated, and their place supplied by better herbage.

SILK CULTURE IN CONNECTICUT.

From the Silk Farmer.

The following letter, addressed to Col. Smith, president of the meeting [at the Franklin Institute] has been handed us for publication. We think it possesses peculiar interest, and should be attentively read by all. Mr. Badger is the present proprietor of the Marshall House, Philadelphia.

Philadelphia, Sept. 25, 1839.

To the President of the Silk Meeting:

Sir—I spent about thirty years of my life in the adjoining town to Mansfield, Connecticut--my farm being partly in Mansfield. During these thirty years a very considerable portion of the farmers in Mansfield fed the silk-worm and made silk. This was done by the good housewife and her children. I was conversant with the business, and never had an idea that there was any mystery at all in it; the eggs, when exposed to the air, hatched without any assistance; the children picked the leaves, and the mother generally fed them; the worms ate of themselves, and wound their cocoons. The wife usually reeled the silk whenever leisure from other duties permitted, so that no expense accrued to the family. She not only reeled it, but twisted and manufactured it into sewing silk. And it is a fact, that those farmers engaged in the silk business, made from it from one hundred to six hundred dollars a year, while the whole of the other produce of the farm did not yield the half of that sum. The consequence was, that the silk growers were not only free from debt, but they and their daughters always had money at interest, and the latter, when married, had always something handsome as a wedding present for their husbands.

With these people the worms were fed in the farm houses, and all the expense incurred was for a few hundred feet of boards. The work was all done, let me repeat, in the family and by the family. The land in Mansfield is generally not well adapted to cultivation, and a Pennsylvania farmer would be unwilling to take it as a gift and cultivate it. Notwithstanding this, the inhabitants of that town are as intelligent, industrious, and moral, as those of any other district in the United States, and I firmly believe, as a whole, more free from debt. Indeed, I had an extensive acquaintance with the people of Mansfield, and I did not know a single silk grower who was not only free

from debt, but in comfortable circumstances, with money at interest, &c., and this was wholly attributable to the profits of the silk business.

As I have already intimated, the silk culture in the district to which I have alluded was not prosecuted by corporations, or rich men, but by the ordinary and small farmer, and was with them a regular business. The trees, too, did not occupy any land worth mentioning, as they were planted along the public roads by the side of the fences, and were thus both an ornament and a means of profit.

I think the only thing required in the production of silk is to give the worms enough to eat, plenty of fresh air, and clean boards every week—the worms will do the rest.

Very respectfully yours, &c.

E. BADGER.

ON THE "DISTEMPER" OF CATTLE.—OATS SERVING TO ARREST THE PROGRESS OF CHINCH-BUG.

To the Editor of the Farmers' Register.

Charlotte, October 18th, 1839.

In the last number of your Register I am requested by Mr. W. I. Dupuy, and you join in the request, to communicate what knowledge I may have in relation to the disease among cattle, commonly called "distemper," or "Carolina distemper." I comply with the request, but am sorry I cannot give any valuable information on the subject. I know of no preventive or cure. I have lost many cattle by the disease, and used many prescriptions for its cure, without success. At one time, many years ago, I thought I had discovered a remedy, but subsequent experiments showed that it was not to be relied on. I presume my conversation about it has given rise to the apprehension that I am acquainted with a cure. At the time referred to, I had lost in one summer nearly half my cattle at one plantation by the disease, when, by falling, one of them broke off a horn, which the overseer discovered to be hollow. As he knew that boring into the horns was the best remedy for the disease commonly called "hollow horn," he had all the cattle gotten up, and bored the horns of all, except a large unmanageable bull. All were hollow, and none of the cattle died that season after the operation, except the bull. I then frequently spoke of the case, and advised boring the horns as a remedy or preventive of the disease. But subsequent trials both by myself and others, have shown that it is not to be relied on, though it has been thought sometimes efficacious. The general opinion in this part of the country is, that cathartics are the best remedy. But to produce an operation is the difficulty, as the contents of the maw, upon opening it after the death of the animal, are found to be perfectly dry. This difficulty to effect a passage has produced many prescriptions, of the superior virtue of which I am unable to judge. I have seen, not long since, and, as well as I recollect, in some number of the Farmers' Register, a strong decoction of the twigs and berries of the cedar tree highly recommended; but know of no instance of its trial.

Happily for this section of country, I believe the disease is leaving, or has actually left it. I heard of but few instances of it the two summers preceding the last, and I have heard of not one the last. For many years since my recollection it was unknown among us; and the general belief is that it came originally from Carolina, and hence the name Carolina distemper. It has been a long and destructive plague; but as it is not, if I may use the term, indigenous, it is to be hoped it may be a long time before it appears again.

The greatest plague we now have to complain of, is the chinch-bug. For several years past we have sustained great loss in our crops of wheat and Indian corn from their depredations, and we have cause to fear great mischief from them the next. It is, therefore, I use the occasion to communicate a statement of facts as related to me, and of which I do not doubt, from which it would seem that their ravages on Indian corn may be stayed after leaving a wheat field. A gentleman sowed a narrow strip of land in oats, (not with the design to protect his corn,) between a wheat and corn field, and the oats retarded the progress of the bug from the wheat to the corn so long, that although there were countless numbers in the former, very little injury was done to the corn. Now I account for the little injury in this way. Those who have paid attention to the subject know that there are, as is the case with many other insects, throughout the warm season, sucessive generations or crops of the chinch-bug, and that in certain stages or forms of existence they do little or no mischief, and that they are in a state to do much injury to the crop when they leave the wheat for the corn. The strip of oats then arrests them, and serves to nourish them until they have changed into another form, when they do little or no mischief, and in the mean time the corn is progressing and getting out of the way of injury. In confirmation of the facts stated and conclusions drawn, I will observe that I noticed in my own fields, that the bug after committing great depredations on a wheat field did but little injury, after it was cut, to an adjoining oat field, having penetrated it no where, as far as I observed, more than fifteen or twenty steps, before it was cut. If then a narrow intervening strip of oats will stay the progress of the bug from the wheat to the corn fietd, it will be well for all those who would otherwise have them necessarily adjoining, to interpose the narrow strip. Perhaps one of fifteen or twenty steps would answer, and do better if sowed late. We know that the corn fields adjoining the wheat are much the most subject to be injured. W. M. WATKINS.

CORN CULTIVATED FOR THE STALK AND LEAF, AND NOT FOR THE GRAIN.

From the Southern Agriculturist.

Savannah, March 14th, 1839.

Mr. Editor,—The high price of labor is producing an important change in our system of agriculture. From our cotton plantations, the old treadle gin is disappearing, and an improved roller horse gin is supplying its place. Upon rice plantations, the thrashing machine, impelled by steam or animal power, is gradually expelling that remnant of barbarism, the flail stock. Although the high price of labor is matter of regret, its tendency is to make us better agriculturists. It calls for a

greater sagacity, as well as a more rigid economy in the management of business. It makes us more saving of labor, and more careful of the health of the laborer. It leads to the adoption of labor-saving machines, and to the gradual substitution of animal power for human power.

The maintenance of the animals introduced by this change of system, is a practical question of great importance, and upon this point I propose to submit a few observations.

It is believed that the average crop of corn and oats in Georgia and South Carolina, does not exceed twelve bushels per acre. Upon this, and the fodder gathered from the corn, we place our dependence for the sustenance of the animals employed in our agriculture. To produce a sufficiency, we are compelled to enlarge our plantings of these exhausting crops, and we devote to these purposes land already impoverished and requiring rest. Among the ultimate consequences of such a system, are abandoned plantations, and emigration. To mitigate this evil, and to assist in the maintenance of our animals, I propose a fodder patch, that is, the cultivation of Indian corn expressly for the stalk, and not for the ear or blade. I propose this stalk fodder, not as a substitute for grain, but as a valuable auxiliary—rendering, in fact, the grain given more efficacious, and enabling the animals to do with less. For the last six years, I have devoted to this purpose a small lot of land, and I estimate the product so highly, that nothing would induce me to abandon the culture. At the usual corn planting season, this lot is trenched four feet apart, with a bull-tongue plough, and in these trenches we sow the common Indian corn, at the rate of two bushels and upwards to the acre. During its growth, this corn receives two or three ploughings, and this is all the culture it gets—it is neither hand-picked or hoed. At every ploughing, the earth is thrown fearlessly towards the corn, which would be buried and destroyed, were it not that the mass of plants, growing in the trenches, enables it to resist the pressure of the earth thrown against it. By this treatment, every particle of grass growing at the root of the corn is completely destroyed.

When the fodder corn begins to tassel, we begin to use it, and not before. The reason is manifest. It is a well known law of vegetable life that when plants are in bloom, then their mucilaginous, saccharine, and nutritive properties, are most fully developed. This is proven by the fact that if herbs be gathered for distillation, or grass be mown for hay, before the appearance of the blossom in both instances, they yield no valuable products. To this law Indian corn constitutes no exception, and hence our reason for waiting until it tassels before we commence using it. If gathered before that time, my persuasion is that the stalk is of little or no value.

We wait then until it tassels before we begin to use it. The ploughman, with a short scythe or sickle, cuts it up at the root, takes it by large armsfull to the cutting box, and when cut it is mixed with chopped oats, and given to our working animals. I feel satisfied, when a sufficiency of this chopped corn stalk is mixed with their oats, that plough horses and mules will do with one-third, perhaps one-half less grain. Besides, while using it, no other forage is required, and this is no trifling convenience. When planted at the usual season, the fodder corn begins to tassel about the 20th June. It comes in at a time when there is frequently a pressing necessity for fodder—when the ploughs are in full action—when animals require food of the most nutritive kind, and when frequently the blade crop of the preceding year is totally exhausted.

We continue to use this fodder corn as long as it lasts, and it has this great recommendation, that the longer it stands, until actually killed by frost, the more palatable it appears to become to animals. After the tassel has dried up, when every blade hangs down, and has become colorless, when in fact from external appearance, we would pronounce the plant actually dead, the stalk will be found to be still perfectly green. I have satisfied myself of this fact, by repeated observation. I have gone into this fodder patch for several years in sucession, as late as the middle of October, and have invariably found the stalk of the corn green and more rich in its nutrive properties, than at any preceding period. The juices of the plant, after being elaborated in the leaves, appear to be concentrated in the stalk, and it contains at that time so much saccharine matter, that it approximates its taste to the upper joints of the sugar cane itself. That this protracted vitality of the stalk is owing to the fact, that the plant is never deprived of the blade, I have not a shadow of doubt. At the very time in October when I found the stalk of this fodder-corn green, crisp, and juicy, the stalks of the crop-corn from which the fodder had been gathered at the usual season, were dried up and dead. I infer from these facts, that the early gathering of fodder is a pernicious practice—because, by impairing the vitality of the stalk of the corn plant, when in the very act of perfecting the ear, it necessarily interferes with the complete maturity of the grain. I advance this as no novelty, but only to reiterate an important agricultural truth. It has been demonstrated by repeated experiments among the farmers of the middle and northern states, that "topping corn" seriously diminishes the amount of the crop. By parity of reason, the abstraction of the fodder before the maturity of the grain, must be attended with consequences proportionably injurious. It is the general impression of planters, that the ear of the Indian corn is completely matured at the time of gathering the fodder, and hence that no injury results from taking away the blade. I greatly doubt the correctness of this impression; Indian corn being an annual, the whole energies of the plant are directed to the perfection of the ear, all the other parts of the plant are but the ways and means provided for the accomplishment of this end. Now, it seems to me reasonable, and probable, that as long as the leaves and stalks remain green, they continue to impart something of value to the ear. The strong sympathies which are known to subsist between the ear, the stalk and the blade, go to confirm this opinion. If the green ear is destroyed by a squirrel, the leaves of that plant soon become discolored, and it prematurely dies. If the blades be stripped when the corn is in mutton, the stalk perishes, and the ear is shrivelled and light. You can mutilate no one part of the plant, without inflicting serious injury on the other two.

Could we abandon the gathering of fodder, we should in many respects be greatly the gainers.

The plant would escape mutilation, and consequently the ear would be completely perfected; the grain would be plump and heavy; would measure further, and fatten more. Besides, there would be the gain of time. There is no work done on plantations, which makes so poor a return for the labor expended. I have heard practical men say that a smart man will, with a scythe, cut a greater weight of hay in a day, than any five hands can gather in blades. As far as my experience goes, this falls short rather than exceeds the truth.

But the question is asked, what shall we use in lieu of blades. My answer is, we have more land capable of yielding hay than we imagine. Upon every plantation there are low grounds, shallow ponds, and patches of swamp, devoted commonly to rushes, brambles and gum sprouts, which, if drained and ploughed, yield handsome crops of hay. Our ordinary high-lands produce tolerable crops of grass, if cow-penned and ploughed. Another resource is that of cutting the grass which springs up on our stubble lands, from which crops of small grain have been taken. Another source of supply would be this fodder-corn I am recommending. Two or three acres of good land appropriated to this purpose, would furnish a large supply of forage. The corn might be cut and stacked in the fields, as is the practice of the farmers of the middle and northern states, and this might be done at any time in September or October, as would best suit the convenience of the planter.

Fodder diligently gathered from these sources, would at least enable us to dispense with a part of the blade crop. The stripping might be postponed until the blades below the ear were dead. By that time, the grain would be so far matured, that it would suffer far less than happens when every blade is green at the time of gathering.

I have never yet ascertained the weight of an acre of fodder corn, but have no hesitation in saying that it is very great. One acre of good land will furnish an abundance of forage for four horses for three months. Mules appear to be especially fond of it, and cows running upon ordinary pastures, will, if fed with these chopped corn stalks, double the butter in a few days.

It is well known that the average crop of corn of the middle and northern states, exceeds our own, and that this arises not so much from superiority of soil, as from the number of stalks they are able to crowd upon an acre. With them, the corn plant does not attain a height of more than seven or eight feet, while with us it is not uncommon to see stalks fourteen feet in height. As a consequence, they are able to leave four stalks in a hill, when we leave only one, and hence their crops are larger than ours. In this climate, then, the tendency of Indian corn is to grow to stalk, rather than to ear, and by adopting the plan I propose for cultivating it expressly for the ear or blade, you take advantage of that propensity, and correct what may be termed an incumberance to valuable practical uses. If this immense growth of stalk militates against the production of grain, it is no small mitigation of the evil, if we can employ the stalk measurably as a substitute for grain.

A DISTINGUISHED FARMER OF NEW YORK.

Murray's Travels in North America.

From Canandaigua, which I left with much reluctance, we passed through a thriving and well cultivated country to Geneseo, where I had the pleasure of being introduced to Mr. W——, the owner of a magnificent estate in the Genesee flats. Fortune seemed not yet wearied of being bountiful, and allowed us to see this most beautiful valley, with the advantage of residing in one of the most hospitable and agreeable houses that I ever entered. Mr. W——'s son accompanied us through his extensive farms, which are formed to delight equally the eye of a Poussin or a Sir J. Sinclair. The broad meadows of an alluvial soil, covered with the richest grasses, as watered by the winding Genesee, are studded with trees, beautifully and negligently grouped, among which are scattered large herds of cattle of various breeds and kinds, both English and American; the meadows are here and there interspersed with fields of Indian corn and wheat, while the hills that rise on each side are crowned with timber, excepting spots where the enchroaching hand of improvement has begun to girdle some of the tall sons of the forest, whose scathed tops and black bare arms, betokening their approaching fall, give a picturesque variety to the scene.

Yet this scene, extraordinary and interesting as it was, possessed less interest to a contemplative and musing mind, than the venerable and excellent gentleman who had almost *created* it; for it was now forty-four years since Mr. W—— came as the first settler to this spot, with an axe on his shoulder, and slept the first night under a tree. After this, he lodged in a log-house; subsequently in a cottage; and he is now the universally esteemed and respected possessor of a demesne, which many of the proudest nobility of Europe might look upon with envy, where he exercises the rites of hospitality, in the midst of his amiable family, with a sincerity and kindness that I shall not easily forget.

[The subject of the foregoing well-deserved eulogy is James Wadsworth esq., one among our most esteemed subscribers and contributors. When thus presuming to name this distinguished farmer, we will add that his zeal for agricultural improvement, aided by the generous use of his wealth, in one remarkable instance at least, has been directed by patriotism and benevolence for the general good of the country. When Mr. Wadsworth had read our translation of Puvis' 'Essay on Lime,' which was prepared for and first appeared in the 3rd volume of the Farmers' Register, he duly appreciated the value of the work, and as much lamented the neglect of the subject in the great agricultural state of New York. He wrote to ask our permission to spread the essay among his countrymen by republication at his own expense, to be distributed gratuitously. Our exclusive right of authorship to the translation had not been guarded by patent, (nor desired to be,) though it was as much respected by the applicant; and we cheerfully and gladly granted

what was so courteously asked. This nobly designed benefaction to agriculture was fully executed by the publication of a second edition of the essay, in a handsome form, under the direction of Professor James Renwick of Columbia College, and accompanied by an excellent general introduction from his pen, which was afterwards transferred to the pages of the Farmers' Register. What has been the effect of this gift, which was as unostentatious as it was patriotic and wise, we know not; but none other could have been better designed, or, if availed of, better calculated to promote agricultural improvement. It was the seed sown, which, if not utterly neglected and unnoticed, would grow to a crop yielding a return of ten thousand-fold.—ED. FAR. REG.]

SAGACITY OF THE LAND TORTOISE.

From the Hartford Courant.

Some time in June 1828, an animal known by that name was found in my garden, in the act of treating himself to green peas, small cucumbers and melons, and which we had attributed to the hens and chickens. Being unwilling to put him to death on the first conviction, a small hole was bored through the skirt of the upper shell, and a small cord of two or three yards in length, was attached to it, and he was tethered out in a convenient place a few rods distant from the vegetables, and marked on his breast plate, 'S. H. W. 1828.' The next day it was discovered that he had made his escape, having gnawed off his "tether string." A few days after this he was again detected in the same place of his former trespass, and to secure him from committing further depredations, a small ring of iron wire was linked into the hole of the shell, a more substantial cord attached to it, and the prisoner again placed upon his tether. This, however, proved insufficient for his safe keeping. The new cord was soon severed, and the vagrant, carrying off with him his iron ring and a small part of the cord, made a second escape. In June 1829, "Monsieur Tonson came again!" and was again detected in his old line of business. A trial for his crimes was instituted—the evidence against him was too clear to admit of doubt—he was found guilty—the number of pea pods, cucumbers and melons of different kinds which he had champed and ruined was ascertained as nearly as might be, whereupon the court, consisting principally of the females of the family, sentenced him to be immediately put to death by decapitation. But the the poor convict had one friend in the court; that friend exerted his influence, and finally obtained a commutation of the punishment from death to transportation, without limit of time. Pursuant to this order he was conveyed to a small pond about a quarter of a mile from the garden, the scene of his transgressions, but, not pleased with his accommodations among frogs and other creeping things soon found his way back to his old friends and their garden. He was then carried nearly half a mile in an opposite direction, and thrown into a small muddy brook, environed with bogs and sedgegrass.

In June 1832, who should appear but our old visitor again, with his mark and iron ring? What should now be done? The majority of the court denounced him an outlaw and utterly beyond the reach of mercy. His friend and advocate, however, urged in behalf of the convict that the sentence of transportation was *without limit of time*, and assured the court that if a convenient opportunity should offer he should send him next to Botany Bay—but if not, he would pledge himself to carry him to a place so distant that little fear could be entertained of his returning again to his old haunts. Upon these terms, a respite was obtained, and his sponsor caused him to be transported to Suffield, and there left in a grass field a little north of the meeting house. This expedient served that year, but in June 1833, we had the *pleasure* of another family visit from our old acquaintance. By this time, the resentment which had been felt toward him, had in a great measure subsided. He had become a sort of a pet and as we had a plentiful supply that year of cucumbers and other garden vegetables, he was allowed the whole range of the garden. But to fulfil my engagement as his surety, and as no opportunity offered to ship him off to Botany Bay, I wrapped him up in a piece of old carpet, so that he could have no means of noticing objects, carried him to Poquonoc, and threw him into a small stream in an alder swamp near Rainbow mills. But, "true as the needle to the pole," so he renewed his visit in 1835, but manifesting a desire to tarry with us longer than his company was agreeable, he was carried to and left in a brook near the foot of Turkey Hill Mountain. On the 20th instant he obliged us with other *call*, and, as I suppose, is yet in my garden.

He appears in fine health, plump and lusty, but has no discernable increase of size, nor appearance of advance in age, since my first acquaintance with him.

He yet wears his iron ring—the initials and date on his breastplate, though rendered somewhat obscure, by abrasion, are, yet legible, and leave no possible doubt of his identity.

SAMUEL WOODRUFF.

Windsor, July 25th, 1839.

ESTIMATES OF ACTUAL MULBERRY AND SILK CULTURE.

From the Northampton (Mass.) Courier.

Mr. Atwell—Sir: If I can learn any thing from the communication of Dr. Graham, in your last number, it is that the silk growers have his entire sympathy and good will, and that it is in the present "mulberry speculation" that he has no confidence. I am glad it is no worse, and I propose to show that the doctor, and all others who have similar doubts, may safely enlarge their sympathies, till they embrace even the "sellers of trees." I will here observe, (and I beg that it may be particularly noted,) that all I may say in the present or future numbers on the subject of silk culture, that I shall never mention or take into consideration the profit on the sale of trees, but adhere strictly to the culture of silk, to add another most important staple to our agricultural productions. I fully agree with the doctor that "very many of those engaged in the growing of trees for sale, have no

idea of engaging permanently in the culture of silk." There is no remedy for it but to overstock the market, and then it will cure itself; but it will be long ere the demand for mulberry trees will cease, if this is to be a silk growing country, (and I *know* it is to be) and some thousands of millions will be wanted. It is only for want of correct information on the subject that there is so much fear of the "wild speculation," and I propose to give a few facts that *should* satisfy the most incredulous, that one dollar each for trees, that can be freely propagated by cuttings, is not above their value for silk growing, and at that price they are within the reach of every farmer.

I shall only state facts, sir, and if I make any mistakes I hope to be corrected by any of your readers who may take an interest in the matter. I shall show by a regular account of Dr. and Cr. of what has been done the present season, and shall first state the case of a neighbor (a farmer) and then give one of my own:

Dr.—Oct. 1838. To cash paid for 200 mulberry trees, $1 each, - - -	$200
To cash for planting and hoeing cuttings for one acre, - - - - -	45
To cash for interest one year, - - -	15
To cash for rent of land, - - -	20
	$280
Add cost of making 60 lbs. of silk (brought up) - - - - - - - -	120
	$400
Cr.—By sale of 6000 lbs. leaves from 12,000 trees, the product of the 200 trees, at $1 per 100 lbs. the purchaser gathering the leaves, - - - -	$60
12,000 trees on hand, average four feet high, equal in value for propagation to those purchased at one dollar, which will yield next season two pounds of leaves each tree, and cuttings for at least 200,000.	
I will not strike the balance to the above, but will only observe, that had the 6000 lbs. of leaves been fed to the worms instead of selling them, a much greater profit would have accrued; the first year the product would have been 60 lbs. of raw silk, at $6 per lb.; (cost carried up,) - - - - -	$360
Add state bounty, $1 50 per lb. - -	90
	$450

Can you believe the above account? It is true to the letter. Was the farmer mad, to engage in such an enterprise while *every body* said it was "all speculation?"

I will now state my own account, and for convenience will take 5 acres of my new farm of 80 acres, (most of which will be planted with mulberries next spring—20 acres of which are now filled with them, for permanent plantation.) You are aware, sir, that the above farm has been considered as worn out, and when I took it last autumn it was overrun with briers, and had not produced a crop for several years. I am thus particular, that our farmers may see the possibility of improving the poorest farm, and making it permanently productive of a much larger profit than I even dare to mention, but which they will readily perceive by the actual result of the first year, and the probable (and I may say certain) result of the next and following years.

The manure used for the above farm is such as is within reach of every farmer, but which has been much neglected, viz: *muck*, or the black vegetable matter found in swamps and bottoms at the foot of hills. It is the best and only *safe* manure for this climate; it causes a vigorous and healthy growth, and permanently improves the soil—while other manures, particularly barn or yard manure, causes a protracted growth, till severe frosts occur, which is death to the otherwise hardy tree. I have lost many hundreds of thousands in that way, and I would caution growers of the mulberry in our climate to beware of barn manure, but to prize every load of muck as the most valuable for safety and profit. It should be thrown out in the fall, to receive the action of frost, and be spread in the furrows or in the hill. Trees grown in it will withstand our hardest winters.

We will now see how the account stands with a part of the "Segur farm." I shall state the price of trees the same as the other farm. Those, however, were grown on better land.

Dr.—To cash paid for 5 acres of land, at $20 per acre, - - - - -		$100
To cash for 1000 trees, at $1 each, -		1000
To cash for carting 1000 loads of muck,		50
To cash for spreading same, - -		15
To cash for ploughing, planting and hoeing,		65
		$1230
Interest on $1230,		72
		$1302
Add account brought up,		1178
		$2480
The quantity of leaves is about the same as on the other lot, but as I chose not to use them this year, no account is made of it, but after stating the number of trees (50,000) we will carry it forward to the next year, and show 50,000 trees with one pound of leaves each (half the quantity) which fed to worms will make 500 lbs. of silk, at $6 per lb. - - -		$3000
Add state bounty, $1 50 per lb. -		750
		$3750
Add to investment, interest to 1840,	$78	
" " Cocoonery,	60	
Making and reeling silk, at $2 per lb. - - - - - -	1000	
Cultivation, - - - -	40	
(Carried up)	$1178	
Deduct whole investment ($2480) and there is a profit over and above of		$1270

We thus have a profit of $1270 *over and above the whole investment and expenses*, with an increase of 500,000 trees, and cuttings enough for ten times that qantity if needed.

SAMUEL WHITMARSH.

Northampton, Sept. 28.

VARIETIES OF WHEAT.

From the Genesee Farmer.

At the first meeting of the English Agricultural Society, the first prize of twenty sovereigns, (or about 97 dollars,) was awarded to Col. Le Couteur for his account of the most approved varieties of wheat cultivated in England. Col. Le Couteur has doubtless paid more attention to wheat and made more accurate experiments in its cultivation, than any other person living, and his opinions are therefore entitled to great weight. We condense from the remarks of Lord Spencer, the President of the Society, a sketch of the favorite kinds, with some other particulars.

The first kind, or the one deemed the most valuable, was the Hoary White or Velveteen, from the chaff having a downy or velvet feel. This wheat after being repeatedly washed in brine that would float an egg or a potato was again washed in lime. The land was argillaceous, and had been well manured with dung, and prepared with the ashes of sea-weed and lime, in places that seemed to require such a dressing. The seed was sown on the 29th of January, two bushels per acre, and and was harvested the 16th of August. The average produce was 48 bushels of 62 lbs. each. This produced of fine flour 2,402 lbs., pollard 126 lbs. and of bran 416 lbs. The estimated clear profit of an acre of this wheat was £15 6s. 9*d*.

The next variety in quality and value was the Jersey Dantzic, but known in different places by various names. This wheat has a smooth chaff, and is not liable to smut. It ripens a week earlier than the velveteen; but in a wet warm season is considered subject to rust. The produce of an acre of this wheat was 43½ bushels, with 430 lbs. of chaff, and 4,681 lbs. of straw. Eighteen pounds of the flour made a loaf of 25¾ lbs. weight, thus proving its value for making bread, as absorbing and combining with nearly one-half its weight of water. The average profit per acre of this wheat is estimated at £12 14s. 6*d*.

The third variety was the Whittington, which was sown in drills three inches apart, on land that had borne potatoes the previous year, subsequently to which it had been dressed with lime and sea-weed ashes. The wheat was 29 days coming up, but the crop was abundant, the straw being generally six feet, and some of it seven feet in height. It ripens some ten days later than the Dantzic wheat, but does not degenerate. The average produce per acre was 33 bushels, with 483 lbs. of chaff, and 7,786 lbs. of straw; the latter being greater in amount than in any other species but one. There were obtained from one acre 1,454 pounds of flour, 477 lbs. of bran, and 47 lbs. of pollard. "The bread made from it is dark, but it keeps well for several days." The profits of this wheat per acre are estimated at £12 11s.

The fourth variety noticed was the Talavera Bellevue, sown on the 3d of February on a light rich loamy soil, 3 bushels per acre, in drills. The seed being very large an extra quantity is required. It is hardy, appearing above the ground in 25 days; and is no more subject to disease than the generality of white wheats. On account of the weight of the ear this wheat is liable to lodge, or be driven down by the wind. The produce was 52 bushels per acre, or 3,172 lbs. of grain, 282 lbs. of chaff, and 5,480 lbs. of straw. There were 2,485 lbs. flour, 38 lbs. of pollard, and 588 lbs. of bran. This wheat makes a fine white bread. The profits per acre was estimated at £16 1s.

Some other kinds were noticed, as the Golden Drop, very productive; the Common Prolific, a coarse wheat; and Brown's Prolific, a good wheat on soils suitable to its growth; but all, in the opinion of Col. Le C., yielding in value to the four first varieties named. From the amount stated as the average of the crops, it would not seem to exceed that of many fields in the Genesee country; though the general average in England is far greater than in the United States. Of the four varieties preferred, the Whittington, from which so much has been expected in this country, stands the lowest in the scale of productiveness. From what we had heard of the quality of the berry of this wheat, as exhibited in the species imported by Mr. Thorburn, we were not prepared to find it a wheat that would make 'dark bread,' which it seems is the fact. The incidental remarks on the time of sowing these wheats, and the period elapsing before vegetation, will explain in part the mistake into which the purchasers of the Whittington wheat have fallen in this country, in supposing it to be a spring wheat in one sense of the term. The English farmers sow wheat from September to April; and the wheats sown during the winter, as they do not vegetate or come forward till March, are called spring wheats, in distinction from those sown in September or October, and vegetating immediately. The spring wheats, properly so called, are there usually sown in April. The average temperature of Great Britain is much lower than with us, consequently grain of all kinds ripen more slowly, and the harvest is proportionably later than with us in the United States.

There can be no doubt that new and valuable varieties of wheat can be produced by skilful cultivation; and though it is not probable that all the most esteemed varieties in Great Britain would succeed well in this country, or prove as valuable in our climate as in theirs, still we think well of the efforts made to introduce the most approved kinds, and do not question that our farmers will find their interest in so doing. In all attempts to cultivate English wheat in this country, however, the difference between our seasons and theirs must be borne in mind, or the sowing will take place at improper times, and certain disappointment be the result to the cultivator.

EFFECT OF PUMPKIN SEEDS ON ANIMALS.

From the Maine Farmer.

Mr. Editor:—I have heard it remarked that if cows were fed with pumpkins freely, their milk was lessened in quantity, or thereby diminished. I doubted the fact; but if it was so I supposed that they produced flesh, or caused the animal to run to fat. A person near me observed that the fact did exist when the seeds were not removed, nor did they produce flesh as I had supposed. Said he, it is a known fact that pumpkin seeds have a very great effect on the urinary vessels. We all know that they are used medicinally for this purpose. And such is their power, that they cause such juices of the system as naturally run to milk or flesh to pass

off in a superabundance of urine. Therefore if you wish to realize benefit from pumpkins, (and they are very valuable, even beyond what they have been thought to be,) you must remove their seeds.

Still I doubted, because I knew that a pie made of pumpkin seeds was very good, and had no such bad effect. Now what man and animals are fond of to eat, if taken in suitable quantity, generally does not prove injurious. This I intimated to my friend, and observed that the seeds were not composed of much aqueous matter. He remarked that many things even in the form of dry powder had an operation on the glands, &c. to produce a flow of liquid matter.

Now, Doctor, tell us if the seeds must be removed when we feed our swine with pumpkins, for they are very fond of them, and I had thought they were very nutritive and productive of growth and flesh. If the flesh should be removed, we farmers ought to know it. I am aware that when the pumpkin seeds are made into a pie, their particles may be so changed by cooking that they will cease to have the bad effect named by my friend. If they are boiled with the pumpkins may not their nature be so changed as to render them beneficial instead of deleterious?

A FARMER.

NOTE.—There is no doubt that the seeds of pumpkins are very diuretic and operate upon any animals, quadruped or *biped*, that take them into the stomach.

If cooked however, with the rest of the pumkins we have thought that they were less so than when given raw, and vastly more nourishing. We never knew any evil consequences arise from them when eaten by cattle or hogs, and we should not go to the trouble of removing the seeds when we wished to feed them out.—*Ed. M. Farmer.*

THE OKRA COTTON.

From the South Carolinian.

In your paper of the 13th ult., a writer calling himself "An Old Farmer," condemns the Okra cotton, which he raised from a quart of seed, which cost two dollars. He did not have Okra cotton seed, but a variety resembling it, and which should be called Twin, not Okra. There are two distinct varieties of Twin or Okra Cotton; some of the characteristics of each, I will point out. The one called *Okra* was discovered in Alabama, in first year's Petit Gulf seed. It grows up generally in one tall stalk—sometimes growing as high as 8 or 9 feet—with very short limbs, which are seldom more than 6 or 8 inches long, and having its bolls in clusters of two to seven, or more. I have seen ten blossoms or forms in one bunch. Sometimes, one, two or three long limbs put out near the ground, turn upwards, and grow parallel to the main stem, bearing fruit as it does.

The other variety, or *Twin* cotton, is said to have been discovered in Chester District. It is now somewhat like the Alabama Okra without being the same. It is about a half way plant, between the Okra and Petit Gulf. I have never seen it taller than 4 or 5 feet. Its limbs, are longer than the Okra, and not as long as the Petit Gulf. Both kinds have twin bolls; but the bolls and blossoms are more numerous in the Okra. Two bolls on the same stem, are frequent in both; but is only on the okra, that I have seen three blossoms within the same calyx, or four, five, or more bolls, in one cluster.

There is also a clearly defined difference in the Chester *Twin*, a darker, green, and more naked seed. No person who has once seen the two plants growing, or the two kinds of seed, will ever mistake the one for the other.

The price paid, is also an evidence that "An Old Farmer" did not get *Okra* cotton seed: none were *ever* sold in Alabama, under five dollars a quart; and in this state the price was 50 cents a seed.

I am not prepared to say, that the Chester kind is not a good cotton. I know too little of it. The staple is good: I have seen some stalks, in gardens, very well filled with bolls; my only object now, is to correct an evident mistake of "An Old Farmer."

To the Alabama Okra there is one objection, which I think can be easily obviated: It grows too tall, and is liable to fall down. The remedy, is to top it, at 4½ or 4 feet. The stalk grows stronger, the bolls fill up larger, and the product is increased by it. As it will bear great crowding on the land, the yield will be greater than from Petit Gulf. It is, in fact, an improved Petit Gulf seed.

A YOUNG PLANTER.

CURIOUS EXTRACTS FROM FULLER'S 'WORTHIES OF ENGLAND,' (1662).

Wonders.—"At Fishtoft, in this county, no rats or mice are found, so that barns built, *party per pale*, partly in this and the next parish, on one side are annoyed, on the other side (being Fishtoft moitey) are secured from vermin. Surely no piper (what is notoriously known of Hamell in Westphalia) did ever give them this *mice-delivery* by his musick.

"It is easier to conjure up many, than to allay one difficulty; other places in England affording the like. At one of the Rodings in Essex, no hogs will root. In another common, no mole will cast. In Lindley, in Leicestershire, no snakes are found. I believe they over-shoot the mark, who make it a *miracle;* they under-shoot it who make it majick; they come nearest to truth who impute it to occult qualities.—"

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Rabits of Norfolk.—"These are an army of small pioneers, whence men have learned *cuniculos agere*, the art of undermining. They thrive best in barren ground, and grow fattest in the hardest frosts. Their flesh is fine and wholesome."

—

"*Pigeons.* These of all fowls live most sociably in a common-wealth together, seeing their government is not, as bees, monarchical. They are generally reported without gall; understand it, their gall is not sequestred into a distinct vessel, as in other creatures. Otherwise we find the effects thereof in their animosities among themselves (whose bills can peck as well as kiss) as also (if their crops be not clearly drawn) in the bitterness of their flesh. They are most swift in flight, and the steerage of their tails conduceth much to their steddy mounting upright. An envious man, having caught his neighbour's pigeons

in a net, feeding on his stack, pluck'd off their tails, and let them go; which, though they could fly forward home, yet were soon after found dead in the dove-cote, famished for want of food, as unable to fly up perpendicularly, and so out at the lover.

"Pigeons, against their wills, keep one lent for seven weeks in the year, betwixt the going out of the old, and growing up of the new grain. Probably, our English would be found as docible and ingenious as the Turkish pigeons, which carry letters from Aleppo to Babilon, if trained up accordingly. But such practices, by these wing-posts, would spoil many a foot-post *, living honestly by that painful vocation.

"I find a grevious indictment drawn up against the poor pigeons for felony, as the grand plunderers of grain in this land. My author, computing six and twenty thousand dove-houses in England and Wales †, and allowing five hundred pair in each house, four bushels yearly for each pair, hath mounted the annual wast they make to an incredible sum. And, if the moiety of his proportions hold true, doves may be accounted the causers of death, and justly answer their etymology in hebrew; Jonah, which is deduced from a root, signifying to spoil or to destroy. The advocates for pigeons plead, that they pick up such loose corn which otherwise would be lost, and uselesly troden into the earth; that probably divine providence, which feedeth the fowls, by some natural instinct directeth them to such grain which would be barren and fruitless; that their dung, incredibly fruitful for the manuring of ground, abundantly recompenseth the spoil done by them.

"However, if pigeons be guilty of so great stealth, they satisfy the law for the same, being generally kill'd for man's meat; and a corrected pigeon (let blood under both wings) is both pleasant and wholesome nourishment."

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"*The great storm in Somerset-shire.* May He, who bindeth the sea in a girdle of sand, confine it within the proper limits thereof, that Somerset-shire may never see that sad accident return, which hap'ned here 1607; when, by the irruption of the Seavern-sea, much mischief was, more had been done, if the west-wind had continued longer with the like violence. The country was overflown, almost twenty miles in length, and four in breadth, and yet but eighty persons drowned therein. It was then observable that creatures of contrary natures; dogs, hares; foxes, conies; cats, mice; getting up to the top of some hills, dispensed at that time with their antipathies, remaining peaceably together, without sign of fear or violence one towards another; to lesson men in publick dangers, to depose private differences, and prefer their safety before their revenge."

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"*Bristol diamonds.* These are the stars of the earth, though such but dimme ones, which St. Vincent's rock near to this City [Bristol] doth produce. Their price is abated by their paleness and softnesse, to which we may add their number and nearness; for, were they but few and far-fetched, their value would be advanced. They are not those unions, pearles so called, because thrifty nature only affordeth them by one and one *; seeing that not only twins, but bunches and clusters of these are found together.

Were this rock of raw diamonds removed into the East-Indies, and placed where the beams of the sun might sufficiently concoct them; probably in some hundreds of years they would be ripened into an orient perfection. All I will add is this; a lady in the reign of Queen Elizabeth would have as patiently digested the lye, as the wearing of false stones or pendants of counterfeit pearl, so common in our age; and I could wish it were the worst pieces of hypocrisy in fashion."

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"*Lampreys.* "In Latine *lampetræ à lambendo petras* "from licking the rocks," are plentifull in this and the neighbouring counties in the river of Severn. A deformed fish, which, for the many holes therein, one would conceive nature intended it rather for an instrument of musick then for man's food. The best manner of dressing whereof, saith my author †, is "to kill it in malmesey, close the mouth thereof with a nutmegg, the holes with so many cloves; and when it is rolled up round, putting in thereto filbard-nut-kernells stamped, crums of bread, oyle, spices, &c." Others (but those miso-lampreys) doe adde, that, after all this cost, even cast them away, seeing money is better lost then health; and the meat will rather be delicious then wholesome, the eating whereof cost King Henry the First his life ‡. But by their favour, that king did not dye of lampreys, but of excess in eating them; and I am confident the Jews might surfet of manna itself, if eating thereof above due proportion.

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Lime. "I am credibly informed that, within few miles of Pontfract, no less than twenty thousand pounds worth of this coarse commodity is yearly made, and vended in the vicinage. It is a great fertilizer of ground, if judiciously disposed of. Indeed the laying of lime on light and sandy ground (like the giving hot cordials to persons in high feavourous, enough to drive them into a frenzy) will soon burn out the heart thereof; which bestowed on cold and chill ground, brings it to a fruitfull consistency, and, prudently ordered, it will for a long time retain the same.

* Dr. Fuller never dreamt of the despatch made by mail coaches. N.

‡ Samuel Hartlib, of husbandry, his legacy, p. 227.

* *Uniones*, quia nulli duo simul reperientur." Pliny's Natural history, lib. IX. cap. 35.

† Camden's Britannia, in Worcestershire.

‡ Stow's Chronicle, p. 142.

ORCHARD GRASS.

From the Western Farmer.

The cock's foot grass (Dactylis glomerata. L.) known in America by the name of orchard grass, is an imperfect perennial, and grows naturally on dry sandy soil. It is a native of the United States. This grass may be known by its coarse appearance, both of the leaf and spike; and also by its whitish green hue. It is probably better adapted than any other to sow with clover, on lands intended for pasture. Its good properties consist in the

early and rapid growth, and its resistance of the drought; but all agree, that to obtain its greatest value, it should be kept closely cropped. Sheep will pass over every other grass to feed upon it. If suffered to grow without being cropped, it becomes coarse and harsh. Col. Powel, of Pennsylvania, after cultivating it ten years, declares it produces more pasturage than any artificial grass he has ever seen in America. After being fed very close it has been found to afford good pasturage, after remaining five days at rest. It is suitable to all arable soils. It abounds in seeds, which are easily gathered; but on account of its peculiar lightness, (the bushel weighing from 12 to 14 lbs.) the seed should be spread on a floor, and sprinkled with water a day or two before it is sown, that it may swell and more readily vegetate. Two bushels of seed are sown to the acre, or half this quantity with clover. The orchard grass should be cut early, except intended for seed, as it diminishes two-sevenths in value as hay, by being permitted to ripen its seeds. It will bear cutting as early as clover, and the latter swath is very abundant. After preparing the seed for sowing, to mix plaster of Paris is recommended. It is one of the most profitable grasses, and much of its success depends upon the manner of sowing.

We noticed a few days since a small lot of this grass sown the last spring, a part of it had been cut and fed to cattle. Where it had been cut it was coming out again, and promises to make another crop in good time. It will be recollected by those who observed it last season, that the orchard grass stood the drought better than any other; from what we have seen we are disposed to recommend it to our farming friends; but we would sow in land made rich with manure, in preference to any other, if we expected to reap immediate benefit.

For the Farmers' Register.

FIRST VIEWS WHICH LED TO MARLING IN PRINCE GEORGE COUNTY.

By the Editor.

Among the persons who have read with interest the 'Essay on Calcareous Manures,' and have received as sound the novel theory and doctrines there maintained, several have expressed their curiosity which had been excited to learn the earliest facts, or the train of reasoning, which led to the imputed cause of the defect of naturally barren soils, and the remedy. Such inquiries have been made of the writer by persons of investigating and well informed minds, but of very different education and pursuits; and they were all pleased to say, in regard to the concise verbal answers made to their inquiries, that they deemed the details likely to be interesting to many, and that if given to the public, they might serve better to induce the consideration and enforcement of the doctrines, than had been done by the mere arguments which had been already published, convincing as they considered the arguments to be.

Though, without these reasons and solicitations, the writer might have still refrained from touching this subject, it was not that he had not held the same opinion—and, except in his own case, would have urged the same course. It is certain, that the tracing of the steps by which any new discovery, or improvement, is reached, must always be interesting in proportion to the admitted importance of the results; and indeed such a statement seems almost necessary to induce the reader to accompany the author from his first premises to the remote conclusion, and which otherwise is only reached through a devious and tedious passage, and by a course of reasoning which is wanting in interest, because the application and tendency of the arguments and proofs are not seen when they are first presented. The objection which restrained the writer from before pursuing a course which he would have highly approved in others, was, that such a narrative of opinions and facts would be indeed a personal narrative, and therefore obnoxious to the charge of egotism throughout. The statement of the reasoning which led to the successful use of fossil shells on the poor lands of lower Virginia, would be incomplete if not accompanied by a narrative of early labors, and the early as well as latest results and effects. In the whole of this, there would be scarcely any thing but statements of what the writer thought, and reasoned, and performed. But the subject must be so treated, or not at all; and having consented to give the narrative, the writer will throw aside all scruples and objections, and endeavor to enter as much into detail, as he, if a reader of others' agricultural improvements and practical operations, would desire to find.

With the beginning of the year 1813, when barely nineteen years of age, the easy indulgence of my guardian gave to me the possession and direction of my property; which consisted of the Coggin's Point farm, with the necessary and yet very insufficient stock of every kind. It is scarcely necessary to add that, at my very early commencement, I was totally ignorant of practical agriculture; and such would have been the case, according to the then and now usual want of training of farmers of Virginia, even if my farming labors had been postponed to a mature age. But I had always been fond of reading for amusement, and the few books on agriculture which I had met with had been studied, merely for the pleasure they afforded, at a still earlier time of my boyhood. The earliest known of these works was an English book, in four volumes, the 'Complete Body of Husbandry,' of which I have not seen the only known copy since I was fifteen years old. This work was probably a mere compilation, and of little value or authority; but it gave me a fondness for agricultural studies, and filled my head with notions which were, even if proper in England, totally unsuitable to this country. 'Bordley's Husbandry' next fell into my hands, and its contents were as greedily devoured. This was indeed written in America, and by an American cultivator; but as he drew almost all his notions from English writers, his work is essentially also of foreign materials.

Thus prepared, I commenced farming, ignorant indeed, but not in my own conceit. The agriculture of my neighborhood, like all that I had ever witnessed, was wretched in execution, and as erroneous as well could be in system, whether subjected to the test of sound doctrine, or the improper notions which I had formed from English writers. I was right in condemning the general practice of my neighbors—but decidedly mistaken

in my self-satisfied estimate of my own better information and plans.

Just about the time that my business as a cultivator was commenced, Col. John Taylor's 'Arator' was published; and never has any book on agriculture been received with so much enthusiastic applause, nor has any other had such widespread early effects in affecting opinion, and stimulating to exertion and improvement. The ground had before no occupant, and therefore this work had to contend with no rival. The larger landowners, of lower Virginia especially, had previously treated their own proper employment, and their only source of income, with total neglect; and very few country gentlemen took any personal and regular direction of their farming operations. It was considered enough for them to hire overseers, (and that class then was greatly inferior in grade and respectibility to what it is now,) and to leave the daily superintendence to them entirely. The agricultural practices, and also the products, were consequently, and almost universally, at a very low ebb. The work of Taylor appeared when these evils had become manifest; and it was received with a welcome which in warmth was proportioned to the magnitude of the evil, and to the exaggeration of the promises of speedy and effectual remedy which the author made, with so much good faith no doubt, but which proved any thing but true to the great majority of his sanguine followers.

Of course, I was among the most enthusiastic admirers of 'Arator;' and not only received as sound and true every opinion and precept, but even went beyond the author's intention, (perhaps,) and applied his rules for tillage to lands of surface and soil altogether different from the level and originally rich sandy soils of the Rappahannock, where his labors and system had been so successful. However, this error was by no means confined to myself; for his other disciples fully as much misunderstood the directions, and misapplied the practices.

It was my main object to enrich my then very poor land; and, for that, Taylor offered means that seemed to be sure and speedy. According to his views, it was only necessary to protect the arable land from all grazing, and thus let the vegetable cover of the land, when resting, serve as manure—to plough deep, and in ridges—to convert all the cornstalks and other offal to manure, and plough it under, unrotted, for the corn—to put the farm under clover, as fast as manured—and the result would be sure. I hoped at first to be able to manure, say 10 to 15 acres a year, very heavily, with the barn-yard manure, and expected that such manuring would give a crop of 50 bushels of corn to the acre. The space, so enriched when in the succeeding crop of wheat, would be laid under clover—and its acquired productivenes be made permanent, by the lenient rotation of two crops only taken from the land in four years. But utter disappointment followed. The manure was put on the poorest (and naturally poor) land; and it produced very little of the expected effect in the first course of crops, and was scarcely to be perceived on the second. Clover could not be made to live on land of this kind; and even on much better, or where more enriched, was a very precarious crop, and which, where the growth was best, certainly yielded the entire occupancy of the ground to natural weeds after one year. The general non-grazing of the fields under grass, or rather under weeds, produced no visible enriching effect, and the ploughing of hilly land (as mine mostly was,) into ridges, caused the most destructive washing away of the soil by heavy rains. These results were not speedily made manifest; and before being convinced of their certainty, I had labored for four or five years in using these means of supposed improvement of the soil, but all of which proved either profitless, entirely useless, or absolutely and in some cases greatly injurious. And even after trying to avoid the first known errors, and using all other supposed means for giving durable and increasing fertility to my worn and poor fields, at the end of six years, instead of having already achieved great improvement, I was compelled to confess that no part of my poor land was more productive than when my labors commenced, and that on much of it, a tenfold increase had been made of the previously large space of galled and gullied hill-sides and slopes.

When more correct opinions had been formed in after time of the actual condition and requirements of such poor soils, it seemed an astonishing delusion that would have been altogether ludicrous but for its serious effects, that I should have counted on so much improving such a soil, and by such means. With the exception of a small part near the river banks, (perhaps one-fifth of the then cleared and cultivated land,) which had been originally of very fine quality, and, however abused and exhausted, was still good land, the farm generally consisted of a soil of sandy loam, usually about three inches deep, and through which a single-horse plough could easily penetrate and turn up the barren and more sandy subsoil. Grazing the fields, when not under tillage, had been the practice, and under it, very little growth was to be seen except the light and diminutive "hen's-nest grass," which formed the almost universal cover of the poor fields of lower Virginia, in the intervals between tillage. Add to these circumstances of very poor and shallow soil, and barren and sandy subsoil, and almost no vegetable cover to turn under, that every field was more or less hilly, and liable to be washed by heavy rains—and the judicious reader will see nothing but false confidence and ignorance displayed in my bold adoption of Taylor's system. Nor was I convinced of my error until after nearly all the fields had been successively thrown into ridges by two-horse ploughs, and all the hilly and more slightly inclined surface had been awfully washed and gullied, by the exposure of the loose subsoil to the action of the streams of rain-water.

While these my supposed measures of improvement were in progress, I was in habits of frequent and familiar intercourse with my oldest and best friend, and former guardian, Thomas Cocke, who resided then on his Aberdeen farm, and since and now on Tarbay, adjoining my own land. My friend was a man for whose mind and mental cultivation I could not but entertain a very high estimation. But, though all his life a practical and assiduous cultivator, and finding his greatest pleasure in his farming labors, he yet was a careless, slovenly, and bad manager, and of course an unprofitable farmer. Therefore, on this subject I held in but light esteem the opinions which he held opposed to my own. One of these, (and which he had first gathered from some old and ig-

norant, but experienced practical cultivators of his neighborhood,) was the opinion that our land which was naturally poor could not "hold manure," to any extent or profit, and therefore could not be enriched. For years I heard this opinion frequently expressed by him, and the evident inference therefrom, that the far greater part of our lands, and of the whole country, was doomed to hopeless sterility; and, as often as heard, I rejected it as a monstrous agricultural heresy—as treason, indeed, to the authority of Taylor, and of every other author on agriculture whom I had read or heard of. But at last, I was compelled, most reluctantly, to concur in this opinion.

What was then to be done? I could not bear the idea of pursuing the general system of the country in continuing to lessen the already small productiveness of my fields, by their course of cultivation. The whole income, and more, was required for the most economical support of a then small but fast growing family; and for any increase of income or net profit, there was no hope, save in the universal approved resort, in all such cases, of emigrating to the rich western wilderness. And accordingly such became my intention, fully considered and decided upon, and which was only prevented being carried into effect by after occurrences.

Just before this time Davy's 'Agricultural Chemistry' had been published in this country; and I read it with delight, notwithstanding my then total ignorance of chemical science, and even of chemical names, except as learned by its perusal. There was one passage in this author which seemed to promise to afford both light and hope on the point in which disappointment had led me to despair. As an illustration of defects in the chemical constitution of soils, and of the remedies which proper investigation might point out, he adduced the fact of a soil "of good apparent texture," which was steril, and seemed incapable of being enriched. The fact which struck so forcibly on my mind was presented in the following concise passage of Lect. iv. "If on washing [for analyzing] a steril soil, it is found to contain the salt of iron, or any acid matter, it may be ameliorated by the application of quick-lime. A soil of good apparent texture from Lincolnshire, was put into my hands by Sir Joseph Banks as remarkable for sterility. On examining it, I found that it contained sulphate of iron; and I offered the obvious remedy of top-dressing with lime, which converts the sulphate into a manure."

Much the greater part of my land, and of all the land of lower Virginia, seemed to me just such as Davy described in this single and peculiar soil. It was certainly of "good apparent texture," that is, it was neither too clayey or too sandy, nor had it any other apparent defect to forbid its being fertile in a very high degree. Yet it was and had always been steril, and, as my experience concurred with that of my older friend in showing, it could not be either durably or profitably enriched by putrescent manures. Could it be possible that the sulphate of iron (copperas) which Davy found in this soil, and which he evidently spoke of as a rare example of peculiar constitution, could exist in nineteen-twentieths of all the lands of lower Virginia? This could scarcely be; and yet, in despair of finding other causes, I set about searching for this one.

It was not difficult, even for a reader so little instructed in chemistry, to apply the test for copperas. It was only necessary to let a specimen of the suspected soil remain soaking in pure water, until any copperas, if present, would be dissolved; then to separate the fluid by pouring off and filtration, and then to add to the fluid some of the infusion of nut-galls. If copperas had been held in solution, the mixture would produce a true *ink*, of which the smallest proportion would be made visible in the before perfectly transparent water. But all these first attempts were fruitless, and I was obliged to conclude that the great defect, or impediment to improvement, in most of our soils, was *not* the presence of the salts of iron. But though not a salt, of which one of the component parts was an acid, might not the poisonous quality be a *pure* or *uncombined acid?* This question was raised in my mind, and the readiness produced to suppose the affirmative to be true, from several circumstances. These were, 1st, that certain plants known to contain acid, as sheep-sorrel and pine, preferred these soils, and indeed were almost confined to them, and grew there with luxuriance and vigor proportioned to the unfitness of the land for producing cultivated crops. 2nd. That of all the soils supposed to be acid which I examined by chemical tests, not one contained any calcareous earth.* 3rd. That the small proportion of my land, and of all within the range of my observation, which was *shelly*, and of course calcareous, was entirely free from pine and sorrel, and moreover was as remarkable for great and lasting fertility, as the lands supposed to be acid, for the reverse qualities. Shells, or lime, would necessarily combine with, and destroy all the previous properties of any acid placed in contact; and therefore, if present universally, and always acting as a poison to cultivated plants, it seemed plain enough why the shelly lands were free from this bad quality, and by its absence had been permitted to grow rich, and to continue productive. Every new observation served to add strength to this notion; and in our tide-water region generally, and even in my own neighborhood, there were plenty of subjects for observation and comparison, both in small shelly and fertile spots, and a vast extent of poor pine and sorrel-producing lands. Still, I could obtain no direct evidence of the presence of acid, either free or combined, by applying chemical tests to soils, (as was tried in many cases,) nor was there any authority in my oracle, Davy's 'Agricultural Chemistry,' nor in any other work which I had read, for supposing *vegetable acid* to be present in any soil. Though Davy adds to the supposition of the presence of the "salt of iron," "or any acid matter," it is clear from the whole context that he had in view the possible and extremely rare presence of a *mineral* acid (as the sulphuric,) and not *vegetable* acid, which my views required, and my proofs were afterwards brought to maintain. Sulphuric acid is sometimes found

* I was not then aware, of the important and novel fact which I afterwards ascertained and established, and now fully received (with very slight acknowledgement of its source) by the geologists of this country, that *almost all the soils* on the Atlantic slope of this country, and even including nearly all limestone soils, are also entirely destitute of *carbonate* of lime, though that ingredient seems universal in all the good soils of England, and the continent of Europe.

in certain clays, and in combination with iron is also in peat soils; but these facts have no application to ordinary soils of any country. Of course, this absence of authority would, to most inquirers, have seemed fatal to the position of an acid principle being *generally* present in the soils of Virginia, and in great quantity and power of injurious action. This was, indeed, a great obstacle opposed to the establishment of my newly-formed opinion; but it was not yielded to as insuperable. Diffident as I then was of any such views of my own, and holding the dicta of Davy as the highest authority, and even his omission of any position as evidence that it was untrue, or unknown, still I was not daunted, and supposed it possible that the soils of this country might vary essentially in composition, in this respect, from those of England; or *barely possible* that even the great chemical philosopher might not have observed the presence of vegetable acid in the comparatively few cases of its existence in English soils. The later observations of subsequent years added much to my evidences of the existence of acid in soils; and still later and scientific investigations of chemists have served to establish that there *is* an acid principle in most soils, in the *humic* or *geic acid*. But these discoveries of chemists had not been published in 1817, (if indeed known to any) nor had my own observations reached to all the proofs which I afterwards (in 1832) published in the first edition of the 'Essay on Calcareous Manures,' and which were still in advance of the now generally received opinions of the geic or humic acid. It must therefore be confessed, that if I reached a correct conclusion, it was not on sufficiently established premises, and known chemical facts. However, reached it was, whether by right or wrong reasoning; and however little supported by direct proof or authority, I was almost sure, in advance of any known experiment, first, that the cause of the unproductiveness and unfitness for being enriched of most of our lands, was the presence of acid, and secondly, and consequently, that the application of lime, or calcareous earth, would, by taking up and destroying the poisonous principle, leave the soil free to receive and to profit by enriching manures.

But even if this theoretical position had been demonstrated, still it might furnish no *profitable* practical remedy. For admitting that the application of calcareous matters would relieve the soil of its great evil, and make it capable of receiving subsequent improvement, yet after being so relieved, the land, I supposed, would be still as poor as before, and would require all the manure, labor and time necessary to enrich any very poor soil; and these might be so expensive, that the improvement of the land would cost more than it would afterwards be worth. These considerations served to lessen my estimation of the utility of the theoretical truth, and to make my earliest applications of the theory to practice hesitating, and very limited in extent.

Having settled that calcareous matter was the medicine to be applied to the diseased or illy constituted soil, I was luckily at no loss to find the materials. In some of the many ravines which passed through my land, and on sundry parts of the river bank, were exposed some portions of the beds of fossil shells, which underlie nearly all the eastern parts of Virginia and several other southern states; the deposite which then had obtained in this region, though unproperly, and still retains, the name of *marl*. I began operations in February 1818, at one of the spots most accessible to a cart. The overlying earth was thrown off, and a few feet in width of the marl exposed, in which a pit was sunk to the depth of but three or four feet. When night stopped the digging and throwing out of the marl, the slowly oozing water filled the pit; and as no proper plan of draining had been adopted, the first shallow pit was abandoned, and another opened. In this laborious and wasteful manner there was as much marl obtained as I was then willing to apply. It served to give a covering of 125 to 200 bushels per acre, to $2\frac{1}{2}$ acres of new-ground. The wood on the land had been cut down three years before, and suffered to lie and rot until cleared up for cultivation in 1818. Though poor ridge land, and of what I deemed of the most acid class of soils, still the previous treatment had given to it so much decomposed vegetable matter, that its product would necessarily be made the best of which such a soil was capable of bringing. And because of the superabundance of food for plants then ready to act, this was not a good subject to show the earliest and greatest benefit of neutralizing the acid. However—notwithstanding this circumstance, and the small amount and poverty of the marl, (which contained but one-third of calcareous matter,) the improvement produced was greater and more speedy in showing than I had dared to count on. When the plants were but a few inches high, and before I had hoped to see the slightest improvement, (indeed none had been expected to show in the first year,) the superiority of the marled corn was manifest, and which continued to increase as the growth advanced. My high gratification can only be appreciated by a schemer and projector—but such a one can well imagine my feelings and sympathise in my triumph. The increase of the first crop, corn, I stated, by guess, in reporting the experiment, to be fully 40 per cent., and that of the wheat which succeeded was much greater. Subsequent measurements of other products of experiments induced me to believe I had under-rated the amount of increase in this first application. (This experiment is the first stated, and at length, at page 37 of 'Essay on Calcareous Manures' 2nd Edition.)

Great as had been the labor of this application, and small its increased product, (comparing both with later operations,) the results served to completely sustain my theoretical views, and also, showed the remedy for the general evil to be far more quick, and more profitable, than I had dared to count on. Another person would probably have despised this small increase to the acre, if supposing the effect to be but temporary; and this all would have inferred, whether judging by comparison with all other manures known in practice, or even if by the authority of books. For the best informed of the old writers (even Lord Kaimes, for example,) while claiming for the effects of marl great durability, still consider that at some period, say 20 or 100 years, the effects are to cease. But my views were not limited within any practical experience, or authority, but by my own theory of the action; and that theory taught me to infer that the benefit gained would never be lost, and that, under proper cultivation, the increase

of product would still more increase, instead of being lessened in the course of time. In thus fully confiding in the permanency of the improvement, I was at once convinced of the operation being both cheap and profitable. All doubt and hesitation were thrown aside, and I determined to increase my labors in marling to the utmost extent of my views. Still the want of spare labor, and the established routine of farm operations which occupied all the force, retarded my operations so much that no more than 12 more acres (for the next year's crop) were marled in that year.

It forms an essential part of the character of an enthusiastic and successful projector, and especially an agricultural projector, to be as anxious to inform others as to profit himself. Of course I tried to bestow upon, and share my lights with, all my neighbors and other farmers whom my secluded life permitted me to meet. This disposition also caused my earliest attempt at writing for even so small a portion of the public as constituted a little agricultural society which I had induced to be established in my neighborhood. To show my earliest opinions and statements on this subject, I will here quote the material part of a communication made to that society, and which was written in October of the year of my first experiment. I copy the extract just as it then stood, and with all its defects of form and of substance. I then shrunk in fear from the greater publicity which the press would have afforded, and had not the remotest anticipation that my first effort, then made, would lead me to the extent of intercourse since established and maintained with the public, both by writing and printing.

"We should be induced to infer from the remarks of those writers who have treated on the improvement of land, that a soil artificially enriched is equally valuable with one which would produce the same amount of crop from its natural fertility; and that a soil originally good, but impoverished by injudicious cultivation, is no better than if it never had been rich. If this conclusion be just (and the contrary has not been even hinted by them) it is in direct contradiction to the opinion of many intelligent practical farmers, with whom my own observations concur, in pronouncing that soils naturally rich, (although completely worn out,) will sooner recover by rest—can be enriched with less manure—and will longer resist the effects of the severest course of cropping, than soils of as good apparent texture and constitution, and in similar situations, but poor before they were brought into cultivation. Should the latter opinion be correct, it is of the utmost importance that the subject should be investigated; as the only conclusion that can be drawn from it, is, that such land must have some secret defect in its constitution, some principle adverse to improvement; and until this is discovered and corrected, it is an almost hopeless undertaking to make a barren country permanently fertile, by means of animal and vegetable manure.

"That *inclosing* has but little effect in improving land naturally barren, is sufficiently proved by poor wood-land. This has had the benefit of inclosing for, perhaps, thousands of years, and is yet miserably poor. It may be said that leaves are not to be compared in value to grass or weeds; but surely leaves ought to improve as much in a thousand years, as grass or weeds in twenty. Besides, it is well known, that leaves taken from this very land, and applied elsewhere, have produced much benefit; and the advocates of inclosing must agree with me in ascribing to this cause, the natural fertility of the most valuable land.

"As to manure, these are but few farmers who have not, like me, experienced complete disappointment in endeavoring to improve land so little favored by nature. In the usual method of summer manuring, by moveable cow-pens, the most negligent farmers give the heaviest covering, by suffering their pens to remain stationary sometimes six or eight weeks. I have known the surface in this manner to be covered an inch thick with the richest of manures, and yet, after going through the same course of crops and grazing with the adjoining unmanured land for six years, could not be distinguished. * * * * * *

"If any one principle should be always found in one kind of soil, and as invariably absent in the other, we might reasonably infer that *that* was the cause of fertility or barrenness. Judging from my very limited observations, it appears evident that calcareous earth constitutes a part of every soil rich in its natural state, and that whenever a soil is entirely or nearly deficient, it never can become rich of itself, and if made so by heavy doses of dung, will soon relapse into its former sterility.

"Let us observe how facts coincide with this opinion. The lower part of Virginia is generally poor; narrow stripes along the rivers and smaller water courses are nearly all the high lands that are valuable, and in this class, exclusively, shells are seen so frequently, and in such abundance, that it seems highly probable that they are universally present, but so finely divided as not to be visible. When we know the change produced by calcareous earth in the color and texture of soil, and in a field of an hundred acres, all of the same dark colored mellow soil, shells may be seen in only a few detached spots, yet we cannot but attribute the same effects to the same cause, and allow calcareous matter to be present in every part.

"The durable fertility of land which contains shells in abundance is so wonderful, that I should not dare to describe it, were not the facts supported by the best authority. The calcareous matter for ages has been collecting and fixing in the soil such an immense supply of vegetable matter, that near two centuries of almost continual exhaustion have not materially injured its value. I have seen fields on York, James, and Nansemond rivers, now extremely productive, which are said to have been under cultivation for thirty and forty years, without any aid worthy mentioning, from rest or manure.

"The same cause operates on low lands, formed by alluvion, and situated on streams accustomed to overflow. Such land is, with very few exceptions, of the first quality; and it is made so by the calcareous matter which the currents must necessarily convey from the strata of marl through which they pass; and which being intimately mixed with sand, clay, and vegetable matter, is sufficient to form the finest and deepest soil. All the rich low grounds which I have had an opportunity of observing, have marl on some of the streams which fall into them, and I have not heard of any on those few which are poor. Not a solitary instance of

shells being found in poor land of any description has come to my knowledge.

"If these premises are correct, no other conclusion can be drawn from them but that a proportion of calcareous earth gives to soil a capacity for improvement which it has not without; and it also follows, that by an application of shell-marl, the worst land would be enabled to digest and retain that food, which has hitherto been of little or no advantage." * * * * * *

"The property of fixing manures is not more important in marl, than that of destroying acids. The unproductiveness of our lands arises, not so much from the absence of food as the presence of poison. We are so much accustomed to see a luxuriant and rapid growth of pines cover land on which no crop can thrive, that we cannot readily see the impropriety of calling such a soil absolutely barren.

"From the circumstance of this soil being so congenial to the growth of pine and sorrel, (both of which are acid plants,) it seems probable that it abounds in acidity, or acid combinations, which, (although destructive to all valuable crops,) are their food, while living, and product, when dead. The most common forest trees are furnishing the earth with poison as liberally as food, while it depends entirely on the presence of the antidote, whether one or the other takes effect. I have observed a very luxuriant growth of sorrel on land too poor to support vegetables of any kind, from green pine brush having been buried to stop gullies; and it is well known how much land on which pines have rotted is infested with this pernicious plant. Marl will immediately neutralize the acid, and this noxious principle being removed, the land will then for the first time yield according to its actual capacity: sorrel will no longer be troublesome; and, by a very heavy covering, I have known a spot rendered incapable of producing it, although the adjoining land is quickly set to the edge. Pines do not thrive on shelly land, whether fertile or exhausted. To this cause I attribute the great and immediate benefit I derived from marl on new-ground: the acid produced by the pine leaves is destroyed, and the soil is capable of supporting much heavier crops, without being (as yet) at all richer than it was."—*Com. to Pr. Geo. Agr. Soc.*

Before proceeding to state later experiments, and general practice and results, it will be necessary to recur to some other connected branches of the subject. The reader will pardon the apparent digression.

So well established and general has the opinion now become that this *marl* is a manure and a most valuable one, that it may seem strange that I should have only arrived at such an opinion, indirectly, by the train of reasoning indicated above. There were hundreds of persons who afterwards said, "Oh! *I* never doubted that marl was a good manure;" but not one of whom had been induced to try its operation. But passing by these *postponing* believers, and all others who confessedly never attached any value to this great deposite, it may require explanation why I had not learned its value from English works which treat so extensively on marl, even though I had then had access to but few of them. It was precisely because I *had* read attentively some of the English accounts of marl that I was *deterred* from using *our marl*, which agreed with it (apparently) in nothing but name. Struck with the importance attacted to marl in England, I had earnestly desired to find it, and had searched for it in vain, years before the early beginning of my farming. The name induced a close examination of what was called marl here; but the "soapy feel," the absence of grit, the crumbling and melting of lumps in water &c., which were the most distinguishing characteristics of the marl of the English writers, were in vain looked for in our shell beds—of which the earth was generally sandy, never "soapy," and of which the lumps were often of almost stony hardness, and if not, at least showed nothing of the melting disposition of the English marls. I had before this, however, found in the American edition of the 'Edinburgh Encyclopædia,' more modern and correct views of marl, and had thereby learned to prize *calcareous matter* in general, as an ingredient of soil whether natural or artificial. But still, even admitting that the shelly portion of our marl would slowly decompose, and gradually furnish some manure to the soil, still it seemed that there was little prospect of its operating as the English marl, of such very different texture and qualities. I then supposed that the shells which had resisted decomposition, even where exposed on the surface of the beds, for centuries, would be as slow to dissolve, and to act as manure, if laid upon the fields. Still, notwithstanding these grounds of objection, the general idea of the value of calcareous manures would have induced me earlier to try fossil shells, but for being *deterred* therefrom by the only actual facts then known of the use. When speaking of my thought of trying marl to my friend, Mr. Cocke, he told me that it was not worth the trouble; that he (attracted merely by the name,) had made several small applications, in 1803, on soils of different kinds, and that he had found almost no visible benefit; and he had attached so little importance to the trial, that he had never thought to mention it, until induced by my remark. This communication was enough to check my then slight disposition to try marl. The old experiments of Mr. Cocke, as well as some much older, and like his, considered worthless by the makers, and almost forgotten, are stated at page 36 of 'Essay on Calcareous Manures.'

As soon as I was satisfied that I had found in marl a remedy for the general and fixed disease of our poor lands, it became very desirable to know the strength of different beds, and of the different parts of the same bed. The rules of Davy, for determining the proportion of carbonate of lime, were easy to apply; and having provided myself with the necessary tests, and other means, I was soon enabled to analyze the specimens with ease and accuracy. This was a delightful and profitable direction of my very small amount of chemical acquirements, and served to stimulate to further study. The amount of knowledge was indeed very small—and is still so, with all later acquirements added. But little as I had been enabled to learn of chemistry, the possession led me to adopt my views of the constitution of soils, and enabled me to double the product, and to much more than double the clear profit and pecuniary value of my land, in the course of a few years after.

Though my own doubts as to the propriety and profit of marling had been removed by my first experiments, it was not so with my neighbors.

Small applications were indeed made by two of them only, in the next year after my first trial. But either because the land had been kept too much exhausted of its vegetable matter by grazing as well as cropping, or because the experimenters could not think of the operation of the manure as different from that of dung, or for both these reasons, it is certain that they were not encouraged by the results to persevere. They stopped marling with this one trial, until several years after, when both recommenced, then fully convinced of the benefit, and were afterwards among the largest and most successful marlers. One of these persons was the late Edward Marks, of Old Town, and the other my old friend Thomas Cocke —who though he had led me to find the disease, could not be speedily convinced of its true nature, or of the value of the remedy. As late as 1822, when he walked with me to an enormous excavation which I was then making in carrying out marl, he said to me, that, "In future time, if marling shall then have been abandoned as unprofitable, this place will probably be known by the name of '*Ruffin's Folly.*'" For some years, my marling was a subject for ridicule with some of my neighbors; and this was renewed, when in after-time the great damage caused by improper applications began to be seen, and which will be described in due order.

Having had in view from the beginning the true action of marl, and fully believing that its good effects would be permanent, and even increasing with time, under a proper system of tillage, I was no more discouraged by what some deemed small profits, than I was annoyed by the incredulity and ridicule of other persons. Almost all the farms in the neighborhood except mine, were regularly and closely grazed, when not under a crop, and, of course, they had not stored up in the soil much either of inert vegetable matter, or its acid product. Mine had not been grazed since 1814, and had been rested 2 years in every 4; and 3 years in 4 on the poorest land. And though, in truth, no increased production had been obtained by this lenient treatment, inasmuch as the increase of acid counterbalanced the increase of vegetable food, still when marl was applied, the acid was immediately destroyed, and the food left free to act. The effect of marling was generally shown most plainly on the first crop of corn, and the limits could be easily traced, by the deep green color of the plants before they were five inches high; and the increased product of the first crop, on acid soils, rarely fell under 50 per cent., was most generally 100, and has been known to be 200 per cent. But even such increase was not satisfactory to many persons, until the action of marl came to be better understood, and the permanency of the effects were credited. In five or six years after my commencement, there were few if any of those of my neighbors, who had marl visible on their lands, who had not begun to apply it. And though it has been injudiciously as well as insufficiently applied since, and not one-fourth of the full benefit obtained, still the general improvement and increased products of the marl farms of Prince George have been very great. The existence of marl, too, which was known at first but on a few farms in my own neighborhood, has been since discovered in many and remote parts of the county; and wherever accessible, it is valued and used. The like observations will now apply to most of the other counties of lower Virginia. Wherever the effects of marling could be seen for a few years, the early incredulity not only disappeared, but most persons were even too ready to believe in marl possessing virtues to which it has no claim. Thus, ignorant or careless of its true mode of operation, they crop the marled lands more severely than before; and if they are not thereby soon reduced as low as their former state of sterility, they are made to approach it as nearly as possible, and at a sacrifice of nine-tenths of the profit from marling which a more lenient and judicious system of cultivation would have insured.

In 1819, the second year, my marling was increased to 62 acres, but most of it at too thin a rate. In 1820, only 25 acres, though at 600 heaped bushels or even more to the acre. Up to this time I had done as most other persons have, that is, attempted to marl "at leisure times," and without making it a regular employment for a certain additional force, or reducing the amount of cultivation, or of other operations on the farm. No person will ever marl to much advantage, who does not avoid this error; and this year's labors showed the necessity of an alteration. The next year, two horses and carts, with the necessary drivers and pit-men, were appropriated to marling at all times when weather permitted, except during harvest, thrashing, and wheat-sowing times. Viewing marling too as the most profitable operation, except the saving of a crop already made, it was made a fixed rule of the farm that marling was to be interrupted for nothing else. My corn shift for that year was reduced in size one-half—so that one-half could be marled while the other was under cultivation. By these means, I marled 80 acres this year, 1821, (and too heavily,) and had all the lessened corn-field on marled land. The product of the half was equal to what the whole had brought before, and I was enabled thereafter to have every field marled over in advance of its next cultivation. In 1822, the land marled was 93 acres, 100 in 1823, and 80 in 1824, which served to cover nearly all of the then cleared land requiring marling. The next three years' marling amounted respectively to 50 acres, 24 acres, and 27 acres, being principally upon land subsequently cleared and brought into cultivation. Since then, there has been no marling on the farm, except on wood-land, not yet cleared, and on small spots formerly omitted, and of which no account was taken. With the exception of such spots, (and some such still remain, because of their inconvenient position,) all the land which was not naturally calcareous, or too wet or too steep for carting on, had been marled by 1827; and none has required any additional dose, though some of the thinnest covered places had been re-marled long before that time, so as to bring them to a proper constitution.

In 1824, I first observed, (and had never before suspected such effect,) the injury caused by having marled acid soil too heavily. To show my first impressions, I will copy the words of my farm journal, written on the very day on which the discovery was fully made.

"June 13th, 1824. Observed a new and alarming disease in a large proportion of my corn—and what makes the matter much worse, the evil is certainly caused by marling. The disease seems

to have commenced when the corn was from 6 to 10 inches high, and to have stopped its growth. Its general color is a pale sickly green, and the leaves appear so thin as to be almost transparent: next they become streaked with rusty red, and then begin to die at the upper ends. Several pulled up, showed no defect, or injury from insects, among the roots. All the land marled from pits Nos. 7 and 9 (both yellow) from 1820 to 1822, is so much diseased as to promise not more than half a crop. The corn is twice as large as on the spaces left for experiment without marl, yet looks much worse; though 3 weeks ago its superiority in color and vigor was even more than in size. With but few exceptions, the land *newly* marled from the same pits, and the old marling from Nos. 1 and 8, (both blue) as well as that not marled, are free from this disease. The parts most affected are those which were dryest and poorest, and of course were least covered with vegetable matter. Yet though the corn on this old marling is generally so bad, it is yet evident that the land is more benefited by the manure than at first: flourishing stalks of corn, 18 to 24 inches high, are seen frequently within a few feet of those most hurt by this disease."

Subsequently, when the whole extent of injury could be seen, the following remarks were written in the journal, at the date below.

"October 15th. The damage caused by marl to this crop I suppose to be about one-third of what the land would otherwise have made, judging from the present and former measurements of the same land, where experiments were made.

"Nearly all the heavy marling in Finnies (at 800 bushels,) about 20 acres,* suffered by it; the the poorest and lightest most injured, here and in Court-House Field. The few rich spots escaped, as did most of the piece plastered (on the heavy marling) in 1820. The marks of this experiment were destroyed, and the superiority was not so regular as to enable me to trace the outlines of the gypseous earth—but an acre of corn might be taken which certainly was plastered, better than any other acre in the old land. This at least proves that *gypsum* contained [if any] in the marl has not caused the disease. The poor land lightly marled in 1819, showed but little of the disease, and none was found in the piece not marled, nor in any marled since the last crop [or now first cultivated since being marled.]

"In Court House Field, the injury was confined to 19 acres, the poorest part of the field, which was in corn in 1821,† marled and fallowed, 1822, and in wheat 1823, corn 1824. The remainder of the old land, which had not been cropped so severely, and was covered as heavy with *blue marl*, brought a fine crop, quite free from the disease. The new-ground was mostly marled very heavy (800 bushels of $\frac{45}{100}$)‡ and this and all my former clearings, (some marled equally heavy,) were also quite free. These facts satisfy me that it was not the quality, but the over quantity of marl which has caused the evil; and that the land which has escaped, owes its safety to its containing more vegetable matter. I forgot to state that on some of the lightest spots of South Field, the wheat was much injured, though blue marl was used there.

"If I had followed my own advice to others, "to put no more marl at first than would but little more than neutralize the soil, and repeat the dressing afterwards" this evil would not have fallen on me. The present loss is not much; but it makes me expect the same on all similar land, marled as heavily. I shall endeavor to avoid it, by giving vegetable matter to the soil—either by manuring, or by allowing 1 or 2 more years of grass in the first term of the rotation. *Why* the quantity of marl applied should do harm in *any* case, is more than I can tell; but I draw this consolation from the discovery—if a certain quantity, (say 500 bushels per acre) is too much for present use of the soil, it proves that it will conbine with more vegetable matter, and fix more fertility in the soil, than I had supposed. That the second crop should be injured, and not the first, is owing to the unbroken state of the shells at first, and, by their being reduced, twice as much calcareous matter is in action after a few years."

Thus it will be seen, from these entries made at the time, that I took a correct view of this great and unlooked-for evil, and was by no means discouraged, or induced to lessen my efforts in marling. But in all after operations, on poor land, the quantity was lessened from 500 and 600 bushels, (and even more of the poorest marl,) to about 300 bushels. With this alteration, the operation was continued with as much zeal as before; and also at a later time on another farm (Shellbanks) purchased afterwards, and where I marled upwards of 400 acres.

When this injury was first discovered, about 250 acres of very similar land had been marled so heavily that the like mischief was to be looked for in the next crop, and thenceforward, if not guarded against. For a more full account of this disease, and my opinions thereon, I must refer to what has been before published, (Essay on Cal. Man. p. 51.) It is sufficient here to say that by pursuing the means there advised—in allowing more rest from grain crops, furnishing vegetable matter to the land, in its natural cover of weeds, in clover, and farm-yard manure so far as the limited supply sufficed—that no very great loss was subsequently suffered, except in the field where the disease was first discovered, and which was marled in 1819. This field was too remote and inconveniently situated, to be manured from the barn-yard; and from that and other causes, (including the failure of clover,) that field, only, still shows injury from marling in the present crop (1839); so much diminished, however, that its general average product this year is fully twice as much as the land could have brought before being marled.

The results of many particular experiments made during the progress of marling this farm were stated in the 'Essay on Calcareous Manures,' and the general benefits and improved products were described in a later publication, (page 112 of vol. vii, Far. Reg.). It is not necessary here to repeat these statements. But as this article may come under the notice of some readers who have not access to the others, the general results, as produced in the whole period of twenty-two years, from the earliest experiment to the last product, will be here very concisely and generally stated.

The many and extensive old galled parts of sloping land, wherever dressed with marl, and

* See Exp. 10, p. 43 Essay on Cal. Man.
† Exp. 11, p. 45.
‡ Exp. 1 to 4, pp. 37 to 40.

even without the further help of barn-yard manure, are now nearly all *skinned over* by a newly formed soil; and though such soil is both poor and thin, and may yet long remain so, the *whole* of its present productive power is due to marling; as such galled land was, before, naked, entirely barren, and irreclaimable by other manures. Where much or rich putrescent matter has been also applied to galls, with or after marl, both rich and durable soil has been formed, though at great cost.

The more level parts of the old and greatly exhausted fields, and the newly cleared wood-land, both kinds being naturally poor, thin, and acid soils, are the only lands which have enjoyed anything like the full beneficial effects of marling. These have been increased in product from 5 and 10 bushels of corn per acre (which may be considered the usual minimum and maximum rates,) to at least 20, and in some cases to 35 bushels, even without the aid of barn-yard manure. Where putrescent manures have been also applied, they have raised the products higher; and these manures are now as durable and as profitable, as formerly they were fleeting and profitless in effect.

The before poor and light soil which formed the greater part of the old arable lands, and which was not above three inches in depth, (and scarcely two inches, when in its natural forest state,) is now seven inches and more, and requires three-horse ploughs to break it to proper depth, where the one-horse ploughs formerly would frequently reach and bring up the barren subsoil.

The valuable operation of marl has increased with time, even where the effects were also the most speedy.

The soil, which before was totally unable to support red clover, is now (except on the most sandy spots) well adapted to the growth, and capable, according to the grade of fertility, of receiving the great benefit which is offered by that most valuable of improving crops.

And generally—notwithstanding all the many and great errors committed in my marling, (for want of experience,) and of still worse general farm management—and though a considerable proportion of the old land was either but little or not at all fit to be improved by marling—and though the land added since by new clearings was all very poor, and worthless for its natural producing power—still the general annual grain products of the farm have been increased from three to four-fold, and the net profit of cultivation and the intrinsic value of the land have been increased in a still greater proportion.

EXTRACTS FROM BEVERLY'S HISTORY OF VIRGINIA.

Of the earths and soils.

The soil is of such variety, according to the difference of situation, that one part or other of it seems fitted to every sort of plant that is requisite either for the benefit or pleasure of mankind. And were it not for the high mountains to the north-west, which are supposed to retain vast magazines of snow, and by that means cause the wind from that quarter to descend a little too cold upon them, 'tis believed, that many of those delicious summer fruits growing in the hotter climates, might be kept there green all the winter, without the charge of housing, or any other care than what is due to the natural plants of the country, when transplanted into a garden. But as that would be no considerable charge, any man who is curious might with all the ease imaginable preserve as many of them as would gratifie a moderate luxury, and the summer affords genial heat enough to ripen them to perfection.

There are three different kinds of land, according to the difference of situation, either in the lower parts of the country, the middle, or that on the heads of the rivers.

The land towards the mouth of the rivers, is generally of a low, moist, and fat mould, such as the heavier sorts of grain delight in, as rice, hemp, *Indian* corn, &c.

This also is varied here and there with veins of a cold, hungry, sandy soil, of the same moisture, and very often lying under water. But this also has its advantages, for on such land generally grow the huckle-berries, cran-berries, chincapins, &c. These low-lands are for the most part well-stored with oaks, poplars, pines, cedars, cypress and sweet-gums, the trunks of which are often thirty, forty, fifty, some sixty or seventy foot high without a branch or limb. They likewise produce great variety of evergreens, unknown to me by name, besides the beauteous holly, sweet-myrtle, cedar, and the live-oak, which for three-quarters of the year is continually dropping it's acorns, and at the same time budding and leaving others in their stead.

The land higher up the rivers throughout the whole country is generally a level ground, with shallow vallies, full of streams, and pleasant springs of clear water, having interspersed here and there, among the large levels, some small hills and extensive vales. The mould in some places is black, fat and thick laid, in others looser, lighter and thin. The foundation of the mould is also various, sometimes clay, then gravel and rocky stones, and sometimes marle. The middle of the necks or ridges between the rivers, is generally poor, being either a light sand, or a white or red clay, with a thin mould. Yet even these places are stored with chestnuts, chinkapins, acorns of the shrub-oak, and a reedy grass in summer very good for cattle. The rich lands lie next the rivers and branches, and are stored with live-oaks, walnuts, hickories, ash, beech, poplar, and many other sorts of timber, of surprising bigness.

The heads of the rivers afford a mixture of hills, vallies and plains, some richer than others, whereof the fruits and timber-trees are also various. In some places lie great plats of low and very rich ground, well timber'd, in others large spots of meadows and savannas wherein are hundreds of acres without any tree at all, but yield reeds and grass of incredible height. And in the swamps and sunken grounds grow trees as vastly big as I believe the world affords, and stand so close together that the branches or boughs of many of them lock into one another; but what lessens their value is that the greater bulk of them are at some distance from water carriage. The land of these upper parts affords great variety in the foundations of the soil or mould, of which good judgment may be made by the plants and herbs that grow upon it.

The rivers and creeks do in many places form very fine large marshes, which are a convenient support for their flocks and herds.

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There is likewise found great variety of earths, for physick, cleansing, scouring, and making all sorts of potter's ware, such as antimony, talk, yellow and red oker, fuller's earth, pipe clay, and other fat and fine clays, marle, &c. In a word, there are all kinds of earth fit for use.

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Have you pleasure in a garden? All things thrive in it, most surprisingly; you can't walk by a bed of flowers, but besides the entertainment of their beauty, your eyes will be saluted with the charming colors of the humming bird, which revels among the flowers and licks off the dew and honey from their tender leaves, on which it only feeds [he means on which alone it feeds]. It's size is not half so large as an English wren, and its color is a glorious shining mixture of scarlet, green and gold. Colonel Byrd in his garden, which is the finest in that country, has a summer-house, set round with the Indian honeysuckle which all the summer is continually full of sweet flowers, in which these birds delight exceedingly. Upon these flowers, I have seen ten or a dozen of these beautiful creatures together, which sported about me so familiarly, that often with their little wings they fann'd my face.

Hunting.

The *Indians* as I have already observed had in their hunting, a way of concealing themselves, and coming up to the deer, under the blind of a stalking-head, in imitation of which, many people have taught their horses to stalk it, that is, to walk gently by the huntsman's side to cover him from the sight of the deer. Others cut down trees for the deer to browse upon, and lie in wait behind them. Others again set stakes at a certain distance within their fences, where the deer have been used to leap over into a field of peas, which they love extremely: these stakes they so place, as to run into the body of the deer, when he pitches, by which means they impale him.

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They hunt their hares (which are very numerous) a-foot, with mungrils, or swift dogs, which either catch them quickly, or force them to hole in a hollow tree, whither all their hares generally tend, when they are closely pursued. As soon as they are thus holed, and have crawl'd up into the body of the tree, the business is to kindle a fire, and smother them with smoak, till they let go their hold, and fall to the bottom stifled, from whence they take them. If they have a mind to spare their lives, upon turning them loose, they will be as fit as ever, to hunt at another time: for the mischief done them by smoak, immediately wears off again. * * * * *

They have another sort of hunting, which is very diverting, and that they call vermine hunting. It is performed a foot with small dogs, in the night, by the light of the moon or stars. Thus in the summer-time they find abundance of raccoons, opossums and foxes, in the cornfields and about their plantations, but at other times, they must go into the woods for them. The method is to go out with three or four dogs, and as soon as they come to the place, they bid the dogs seek out, and all the company follow immediately. Wherever a dog barks, you may depend upon finding the game, and this alarm, draws both men and dogs that way. If this sport be in the woods, the game by that time you come near it, is perhaps mounted to the top of an high tree, and then they detach a nimble fellow up after it, who must have a scuffle with the beast, before he can throw it down to the dogs; and then the sport increases to see the vermine encounter those little currs. In this sort of hunting they also carry their great dogs out with them, because wolves, bears, panthers, wild-cats, and all other beasts of prey are abroad in the night. For wolves they make traps, and set guns bated in the woods, so that when he offers to seize the bate he pulls the trigger, and the gun discharges upon him. What Elian and Pliny write of the horses being benumb'd in their legs, if they tread in the track of a wolf, does not hold good here; for I myself and many others, have rid full speed after wolves, in the woods, and have seen live ones taken out of a trap, and drag'd at a horse's tail, and yet those that follow'd on horse-back have not perceived any of their horses to falter in their pace.

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Wild horses.

There is yet another kind of sport which the young people take great delight in, and that is, the hunting of wild horses; which they pursue sometimes with dogs, and sometimes without. You must know they have many horses foaled in the woods of the uplands, that never were in hand, and are as shy, as any savage creature. These having no mark upon them, belong to him that first takes them. However the captor commonly purchases these horses very dear, by spoiling better in the pursuit; in which case he has little to make himself amends, besides the pleasure of the chace. And very often this is all he has for it, for the wild horses are so swift, that 'tis difficult to catch them, and when they are taken 'tis odds but their grease is melted, or else being old, they are so sullen that they cannot be tam'd.

MARLING IN SUSSEX. PHILIPS' MARL RAISING MACHINE.

To the Editor of the Farmers' Register.

Shellbottoms, Sussex Oct. 15. 1839.

Though wholly unaccustomed to write for the public, I cannot repress the strong desire I have to address you a few lines for the purpose, and in the hope at least, that my attempt may be of some service to the great cause you have long zealously and efficiently promoted. But enough of preface. It is known to you, that about two years ago, I discovered on my farm a large body of fine strong marl, yielding by analysis of three or four pits, 35 per cent at top, 55 at 5 feet, and 68 to 72 at 10 feet in the bed, two or three of the pits opened by me having been worked to that depth without any apparent diminution of quality, and one only being so mixed with large lumps of sand at 8 or 9 feet deep, that we abandoned it. My first efforts were with manual labor, to throw it on the surface; but

hearing repeatedly of Mr. Philips', and one other machine of great promise, and indeed, when in use, giving conclusive proof of the value of it, I prepared the timber, engaged Mr. George Philips the inventor, to assist, and in the month of March last, he, with my own carpenters built one for me, and put it to work. I wish all improvers with marl who get it from pits of caving earth, or water running in so freely as to be in the way, would come and look at mine when at work, being well convinced myself that in such situations they are extremely valuable.

I commenced raising marl by hand two years ago in August, and during that year, and the following winter, got out 25,000 bushels, which was applied to the land at the rate generally of 250 bushels per acre. In one instance, on a wet, low, waste spot of land, of about 4 acres, I ploughed in about 375 bushels to the acre; the corn crop on it was good for such land. In March, it was sown in oats, and in a few days, say by the 20th of the month, in clover seed. The crop of oats was very fine. The clover took kindly, has been, in August, 3 feet high, and is now as thick as need be, and about two feet high. The field in which this spot is situated, contains 45 acres. The whole was marled and ploughed in with double ploughs, 5 inches deep, but the covering very scant, nothing in fact but a scattering growth of weeds and a little crab grass and hen's-nest grass. I marled a slip fifty feet wide, across the field, from north to south, at the rate of 125 bushels per acre, and another of twenty-five feet wide half across, at 500 bushels per acre. I am unwilling to pronounce any opinion as to the difference between the crops, corn, oats, or clover, grown on the scant, on the average, or on the double quantity of marl. You will keep in mind that the body of the field was marled at the rate 250 per acre. I shall notice the progress of the next crops of corn and wheat, and will then let you know decisively my opinion as to the advantage or propriety of applying either of the different quantities. I am the more desirous to set some others at observing the difference between the very large and the small quantities, because it is stated in the September No. of the Register, that 100 bushels of marl is enough for one acre of land.

I am now at work with the machine raising marl, though the quantity on the surface at the different pits is estimated (guessed would be the best term,) at 50,000, and from that to 30,000. In three weeks, if weather permit, more will be ready for the carts than I can haul away in twelve months. I am an enthusiast in your cause; in fact it is mine, and every patriot's cause, and I conform strictly, except as to quantity of marl, with your directions in your 'Essay on Calcareous Manures.' I sow clover, but a small portion only is to be grazed, and it is accordingly kept sacred from the hoof; though I have lately obtained at great labor, and risk, and some expense of money, two fine calves of the Durham short horn half blood, four lambs, two of each sex, of Bakewell and Merino blood, very fine size, wool and form, and the calves unequalled before among us; and two pigs of an extraordinary size, and beautiful appearance of their age, milk-white in color.

In my endeavors to escape from, or to cure a terrible disease which had afflicted me for three years, I went up to the vicinity of Winchester, the last of July. On my way, and whilst staying over the ridge, I saw not an acre of clover equal to my own sown in March last, on good land to be sure, and marled at the rate of three hundred bushels to the acre. We had cut about one-third of the lot, the whole being 7 acres, for seed, and at my return, 29th September, it was still superior to any I left in that fine clover country, which I had just left. It shall not, however, be concealed that the last spring was fatal to clover there. I did not see a stack of clover hay, nor hear of one, in the country. Seed clover was almost as scarce, but under the belief that it could hardly be got for sowing, several in the vicinity of Whitepost were cutting a little for their own use; but only two men, spoken of in the country, would make over twenty bushels, and those two together, perhaps two hundred bushels. And here more information is respectfully solicited from men of experience, for my own and for the general benefit. Is it best to clean it or pluck it from the straw and stem, and sow it in the chaff? If to clean be best, what is the most approved method of doing so? And particularly, I would like to know if any one has ever tried the cotton gin; passing it between the saws in the manner of cotton. One of your correspondents in the July No., asserts that the difference is nothing at all between using marl as a top dressing and ploughing it in, and this, as he asserts, after an experience of forty years. Now, Mr. Ruffin, let it be understood by all, that I have on the surface ready to be hauled and applied in my best guess, 30,000 bushels, and am within a few days of being ready in every respect to commence moving it; think of the difference to me, between applying 250 and 125 or 100 bushels to the acre! And not to me alone, but to others, the fact would be important if it were well ascertained that 125 bushels, say, is as good to the acre, as 250, and that the mere sprinkling it on the top of the land, answers as well as ploughing it in. I am well convinced, that it takes me nearly as long to plough in, as to haul; and by the rule of three, it would take twice as long to apply 250 as 125 bushels, but such is not the fact, for the more land you marl, the further you would be from the pit at the end of every day or two; it is easy and plain however, to see that the saving of time and labor to the improver would be prodigious. The answers to the questions I have asked, would I think be of general benefit, and under that view of the matter, I hope that men of knowledge and experience will give their information to the public through you, and all of us be benefited by their communications.

Thus must close my first essay in this line, only begging that whatever you may think tiresome, or valueless, may be erased at your discretion, or the whole thrown into the fire if you think it best. Whatever be the success of my letter, I am deeply anxious for the success of the agricultural interests, and am your friend, and humble servant, JOSEPH MASON, sen.

November 8th, 1839.

P. S. Forgetfulness, rather than the want of importance, prevented me from giving you in my late communication the description of my marl machine, which so well deserves notice. I state this as an apology for adding a few paragraphs, though fearful that it is too tedious and too long to meet

with your approval. Mr. Philips, the inventor, gave me a bill of the timber, amounting to, say 1000 feet, and so full an explanation of the machine as to enable my own workmen to do all except two or three days work, which was aided in and superintended by Mr. Geo. Philips himself. The machine was put in operation merely to try it in March last, but no work done. When our crop was "laid by" as the phrase is, my son (I being in Frederick in pursuit of health so long unknown to me) did not keep an account of the days employed, but it could not be more than 35 days. Four and sometimes five hands were employed. In the want of that sort of daily account of progress it is impossible to say what number of bushels were raised in any one day, but of the general result, there is but one opinion by my son and myself. Upon my return we decided that four hands could with ease do four times as much as without it; 5 or 6 can work without incommoding each other. We think the quantity of 20000 bushels, and the work is by no means laborious. In the preceding twelve months we had raised with an equal or greater number of hands a little less than 26000 bushels. I have begun only yesterday to haul it with excellent teams, two wagons and two ox-carts, for I find the wagon and ox-cart more advantageous to employ than single-horse carts. My son thinks $80 ample pay for building a machine, every thing being found. We find a material difference between one pit and another; some ground is very sandy, and caves badly, and the water comes in more freely. We have, however, few such spots. I think the machine will raise in my common pits, with 5 hands, 600 and probably 750 bushels per day; and the digging the marl is the hardest of the labor. J. M.

REMARKS.

We are much gratified to meet our good old friend as a contributor to the pages of the Farmers' Register; and it adds much to this gratification to know, from this and other sources of information, that in his old age (and diseased and feeble, as we regret to learn,) he is marling his land with all the energy and enthusiasm of youth; and in a few years from the first discovery of his marl, his labors will have doubled the product of the farm which he had so long before cultivated, without producing any increase of fertility or productiveness. May he not only see the certain and speedy result of his present labors, but live long in health to enjoy the greatest reward which can be bestowed on a farmer—the seeing the new and permanent productiveness of his land caused by his own labors of mind and body. His example, too, we hope will do more for his countymen, than have our precepts and example united. For, very few landholders in Sussex have yet availed properly of the marl which underlies the whole county; and there is no county in Virginia, possessing that natural advantage, which is less indebted to our instruction, or that has heretofore given less support to, and of course received less benefit from, the publication of the Farmers' Register. Yet we will dare to assert that if the instruction there offered, even as to marling alone, had been availed of, that the agricultural value and profits of the county would have been already doubled, and that by improvements yielding clear gain immediately and permanently. We proceed to answer our friend's inquiries.

No precise quantity of marl can be correctly prescribed as a general rule. It is necessary to know in advance, 1st, the strength and character of the marl, 2nd, the texture and degree of fertility of the soil, and 3rd, the treatment to which it had been, and is designed to be subjected in cultivation. Yet with these three *data*, it is easy for any farmer to apply a proper quantity in every possible case. The more clayey and still more the richer the land, or the more full of vegetable matter, and the poorer the marl, the heavier should be the marling; and the lighter in proportion to the extent of the reverse conditions—or to the sandiness, poverty and nakedness of the land, and the richness of the marl. In one case, 100 bushels of marl may be as much as is profitable or safe to apply; and in another it would be both safe and profitable to give 800. General rules to this effect, but more fully stated, are given at page 56 of 'Essay on Calcareous Manures,' 2nd Edition.

We have never attached much importance to the difference of laying marl on the grass or weeds, and ploughing under for a crop, or on the surface of the land after being ploughed. Each mode has its peculiar advantages and disadvantages, which are so nearly balanced, that it is best to consult convenience in other respects, and choose accordingly. If to be ploughed under with the turf or weeds, (and mixed by the tillage of the crop,) marl will have most of early effect, because of its being in contact with the putrescent matter, and of their reciprocal and beneficial action on each other. But the attendant disadvantage is, that, if ploughed under with a good furrow, or even five inches deep, the subsequent tillage will not serve fully to bring up and mix the marl with the soil, without which (and especially if lying beneath) the marl is of very little effect. If carted on after the land has been ploughed, and mixed by the subsequent tillage, the mixture will be much more perfectly made. But the labor of carting on ploughed land is greater, and the operation is of course hurtful, by making the ground hard.

But the ploughing under of marl is worse than labor thrown away, unless for the immediate cultivation of a crop. If laid on land a year or more (as may sometimes be convenient) before the field is to be cultivated, it will be much better to spread carefully, and leave it on the surface, than to

plough it under, and so leave it to stand. Marl (or lime) if in lumps or masses, no matter how soft, will be of no use as manure. The manure should be mixed and diffused through evey part of the soil, and not placed deep at first.

We have heard before of the value and operation of the machine of Mr. George Philips, (of Petersburg,) and have urged its ingenious inventor to serve the marling interest by having such machines erected for his own profit. But though he has aided and given the necessary instructions to build several, which have served their purpose to the entire satisfaction of the different proprietors, he has not sought to make the machine an article of profit to himself, and thereby to make it the most profitable to the public. Strange as it may seem too, he has not even wished nor thought of *preventing* its construction by others, by the protection of a *patent right*. If we could have obtained a draught and description of the machine, we should before this, have published them. But we have not seen one, and have formed our favorable opinion merely from the report of others. Whoever desires to draw marl from a considerable depth, or from wet pits, will do well to apply to Mr. Philips, (at Petersburg,) for his instruction, which he will not withhold, even if he may not find it convenient to undertake the construction desired.

—Ed. F. R.

LETTERS FROM A YOUNG FARMER TO MR. JAMIESON.

To the Conductor of the Farmers' Magazine.

Sir: Three years ago, I sent you a series of letters from a young farmer to his father, (*vide* Vol. 8. p. 84. *et seqq.*), which, I understand, met with a favorable reception. Influenced by the like motive as then guided me, namely, to disseminate practical information concerning rural affairs, I, at this time, take the liberty of handing you some letters from the young farmer to his *quondam* preceptor, written after a farm had been taken on his account, wherein a picture, tolerable correct, is furnished of the several articles of business which usually occur during the first twelve months of a lease. The operations formerly detailed were perhaps executed upon a scale rather too large to be imitated by men of ordinary capitals; but those to be now described merit a different character, being in fact an exact representation of what daily occurs in every quarter of the country. I have arranged the letters into four classes as formerly; one of which may, if you please, be presented in each number of this volume. In class first, the young man is put into possession of his farm. In the second, the ground is cultivated and laid down for his first crop. In the third, his grass and turnip husbandry is described. And in the fourth, his harvest-work, &c. is fully explained. These are the leading and chief subjects discussed in each class, though digressions are often made to other matters naturally occurring in the course of the correspondence. I trust the whole will be acceptable to your readers; and, in particular, that such of them as are entering upon rural life, without having acquired knowledge in the school of experience, will, in several respects, be thereby benefited. At all events, the correspondence may serve to amuse, if it does not prove beneficial to the readers of your work, and, under these impressions, it is respectfully submitted to their impartial consideration. I am yours, &c.

PHILO-GEORGICON.

Class 1st.

February 8th.—Having concluded an agreement with the proprietor of the farm mentioned in my last, permit me to crave your advice with regard to my future conduct. I am encouraged to take this liberty, by a remembrance of your former kindness, and also by an impression that the firmest dependence may at all times be placed upon your prudence and judgment. Do, my dear sir, favor me with your assistance on this occasion; for, if I once go wrong, it may be a long while before I go right. Listen with patience to my desultory opinions; and examine with attention the crude and undigested schemes that may be presented. Correct me when wrong, and keep me from straying into the paths of error. Often have you told me, that perfect management could only be learned in the school of practice; and that a long attendance was necessary before the ablest scholar could merit the character of a good agriculturist. All these things now rush upon my mind when I am going to enter into rural life, and urge me to unbosom myself to one capable of affording the aid that is wanted. Excuse these egotisms. Attribute them entirely to that anxiety which every one must, less or more, feel on such an occasion; especially if without confidence in their own abilities.

The farm I have taken contains three hundred Scotch acres, divided into eighteen enclosures, and pretty well situated, both as to obtaining a full supply of lime, and to good markets, where produce of all sorts may be readily disposed of at a fair price. The soil is of different qualities and varieties; one half of it being a strong deep loam approaching to clay, and naturally well calculated for the culture of beans and wheat; about fifty acres are of thin clay, capable of carrying wheat if well manured, but apparently unfit for an extensive rotation; and the remainder is good turnip soil, though not of a gravelly nature; therefore, able to carry peas and beans. The whole farm is in tolerable good order at present, having been preserved in shape by the former tenant; that is to say, he was not permitted to take two white crops in succession during the last five years of his lease;—a regulation which, so far as I know, has been strictly adhered to. According to the lease, he was also bound to leave one sixth of the farm in grass of different ages; and the like quantity uncropped, as a turnip or fallow break; which prestations are complied with. He is likewise bound to leave the whole dung of the penult crop upon the premises for the use of his successor; so, from these things, you will see that my entry cannot be considered as an unfavorable one. For the dung, and the land that is uncropped, value is to be paid him, according as

the same shall be ascertained by neutral men of skill and capacity mutually appointed. The condition of the houses and fences is also to be submitted to neutral men. Here, my dear sir, allow me to request that you would act as my arbiter on this occasion. The matters to be determined are of some importance to me; and I am the more anxious to have my interest under your guidance, since I learned from my father that heavy losses, on one side or other, are often sustained, when unqualified persons sit in judgment. The clause with regard to fences bears, that they are to be capable of keeping in cattle and sheep; and as to houses, that they are to be in good habitable condition. To me these terms appear loose and unprecise; though, to persons of experience, their meaning may not be doubtful.

I come now to the rent agreed upon, which I am fearful may be too high; but, being offered under the express sanction of my father, must be reckoned as not higher than the market value of similar soils. In short, the rent agreed upon is one thousand guineas, or three pounds ten shillings per acre, which is a smart one especially as the public burdens, say property-tax, horse-tax, window lights, statute labor, &c. must be added; and these may be computed at ninety pounds, or six shillings per acre more. My father, in valuing the farm, trusted much to the goodness of its condition, and the regular mode of cropping exercised for several years; and assured me, that, under different circumstances, his estimate would have been curtailed considerably. He added, that he has known farms newly taken, where one year's rent could not be paid out of two crops; whereas, in the present instance, the rent might nearly be paid at the outset. This, to be sure, is an important matter; freeing me from an expensive outlay in the first instance, which in fact, would operate afterwards exactly in the same way as so much more rent. I wished greatly to have had the benefit of your advice before the transaction was concluded; therefore, felt much concern when I learned that your other engagements prevented us from obtaining it.

Allow me, in the next place, to solicit your advice concerning the most suitable rotations of cropping for the several soils described. I shall throw out my crude ideas on that subject, submitting them entirely to your better judgement.

First—On the strong loam, I am inclined to think that an eight, course shift may be most profitably followed, especially, as that soil is divided into eight enclosures, some of them more, some of them less than twenty acres, which would cause the arrangement to suit well when grass was resorted to. The rotation might commence with a complete summer-fallow; 2. go on with wheat and grass seeds; 3. pasture; 4. pasture; 5. pasture; 6. oats; 7. beans; 8. wheat. My father thinks, as the land is well enclosed, and profits from grass husbandry on the increase, that the benefits of this rotation may exceed those to be obtained from employing the plough more extensively; and that whilst only one dunging was required during the rotation, the whole crops may be expected good from the vegetable manure accumulated during the three years of pasturage.

Second—On the thin clays, it appears expedient to exercise a gentle rotation, otherwise full crops cannot be expected. Say, 1. summer-fallow with dung; 2. wheat and seeds; 3. clover and rye-grass; 4. oats. You have often told me, that grass husbandry did not pay on such soils after the first year, and that as good oats were got after one year's grass as after three years. Satisfied that these sentiments are well founded. I propose that the fifty acres of thin clay should be divided into four breaks, and cropped in the way described. According to any other plan, the same quantity of produce cannot be obtained at so little expense of labour. In fact, five, or at the most six ploughings, are only required during the whole rotation.

Third—As to the light soils, I am clear that turnips should be the basis of any rotation that may be adopted. This, I know, will gain your approbation. I am more doubtful about the after crops; but let me suppose the course to be as follows: 1. turnips; 2. wheat on the portion of ground cleared by the first of March; barley on the remainder; grass seeds to be sown with both; 3. clover and rye-grass, either to be used in soiling, or manufactured into hay; 4. oats; 5. peas and beans drilled; 6. wheat. There being one hundred acres of light soil, this gives about 16⅔ acres for each break. My father says the rotation is a good one, if dung can be administered twice in the course of it;—a point which cannot be ascertained at the present moment.

Now, let me bring the crops of the several rotations into one view, before calling your attention to the number of men and horses that will be required in their cultivation. Upon looking back, it appears that there will be nearly thirty-seven acres of wheat upon the strong loam; twelve and a half acres upon the thin clay; and twenty acres upon the light soils, supposing one half of the turnip break cleared in time, making, in all, seventy-four and a half acres annually under wheat. The extent of barley ground will be eight acres and a half, or thereby; of oats about forty-eight acres; of beans and peas about thirty-five acres, of turnips nearly seventeen acres, besides thirty-two acres of plain summer-fallow. The total number of acres, therefore, under the plough in one season, according to these rotations, is two hundred and fifteen; whereof one hundred and thirty-one will carry white corn crops, and fifty-two beans, peas and turnips; whilst eighty-five acres are in grass of different ages; and the remainder of the farm, viz. thirty-two acres, under the radical preparatory process of summer-fallow. In my humble opinion, the above sketch is not far amiss, especially as it includes the cropping of various soils, whose properties are so dissimilar, as to render what may be called good management upon one of them altogether inexpedient upon the others.

Do you think five ploughs and ten horses will be quite sufficient for carrying on the work I have chalked out? Or would you consider six to be necessary? To save a plough in these times, is the same thing as to save one hundred guineas; though I am well aware, if the strength kept is below the work to be executed, that every saving in the first instance will ultimately turn out a real loss to the person who attempts it. Still, as I remember that a plough with you cultivated more acres than I have mentioned, and know that an extensive farmer in this neighborhood, whose farm is chiefly composed of loam and clay soils, had last season 330 acres under grain crops, whilst his strength

did not exceed ten ploughs;—I say, when I reflect upon these circumstances, I cannot conceive that five ploughs will be insufficient for working the farm that I have undertaken. If I entertain any doubts, it is with regard to the summer work; because a defect in any part of what may be called the radical processes, is felt during the whole of the rotation, of which they form the basis. But, as a supernumerary horse may be useful, and serve to keep labor agoing when a casualty occurs, I can, with such an auxiliary, get on with horse-hoeing the drilled crops; at least, that necessary work may thereby be considerably assisted. Besides, as my spring work will not be extensive, the turnip and naked fallows can be earlier prepared than otherwise would be practicable. Little more labor will be required for the turnip break, than formerly allotted to the same extent of barley ground; and, by performing that labor at an early period, the work of the season will be thereby greatly advanced.

I have engaged five married servants as ploughmen, and two as laborers at odd work. Each of them is to get 12 bolls of oats, 3 bolls of barley, and 2 bolls of peas, with maintenance for a cow through the year; the carriage of what coals are wanted, land for sowing a peck of lintseed, and land for planting potatoes to the extent of one-tenth of an acre. The servant who is to sow the corn, gets also a pair of shoes; and if he continues with me till next year, he is to receive half a boll of wheat, or the value of it, for stacking the crop: the whole are to have maintenance in harvest. But as I will not have any harvest work for this year, it is stipulated that each man is to receive 3 firlots of oat meal in lieu of his maintenance.

The fallow and turnip break left by my predecessor, got one ploughing from him, according to the lease, for which he is to receive payment. I am endeavoring to engage people in the neighborhood to cross-plough the part intended for turnips, as soon as the weather permits; and will also try to get the plain fallows cross-ploughed as early as possible. Upon inspecting the fields diligently, my father is of opinion, that no more than 12 acres can this season, with propriety, be under turnip crop, there being a hazard that the ground would not in time be suitably prepared. I have offered 12s. per acre for the first and second furrows, and 2s. per acre for each close double time of harrowing; and am in hopes these offers will be accepted. The rest of the work may be delayed till I am in possession. Advise me what sort of stock will be most eligible for the grass land at Whitsundy. Very likely, as there are no restrictions upon my predecessor in that respect, it will at that time be eaten down to the roots; therefore, to close up the fields for a month may be a prudent measure. Ten acres of the grass land were seeded last year, and are not to be touched by my predecessor; so I will not be scarce of horse food at entry; but there is no restriction with respect to the remainder.

I have given directions to a neighboring tradesman to make ploughs, carts, harrows, &c. for me, all of the best quality. With regard to the plough horses, my father is clear that it will be best to purchase them at the fountain head, *i. e.* at the West-country market; though he says we may look at any roups at the time in the neighborhood, and see if any are there to be procured. In all these matters I shall be directed by my father. His advice shall never be disregarded; nor will I at any time act contrary to his sentiments. He knows business, and I am only beginning to learn it; though, with assistance from him and my *quondam* preceptor, I may in time be able to render similar aid to other people.

Upon looking over what is said, I find the thrashing machine on the premises has not been noticed. The machine is a good one, and in a complete state of repair; therefore I have offered to take it at the valuation of the celebrated Mr. Meikle; a person to whom agriculture is undoubtedly under the greatest obligations. My predecessor agreed to this proposal at once; adding that, from his personal knowledge of Mr. Meikle, he was sure the business was in good hands. You are also well acquainted with that ingenious mechanic; therefore I inform you, with pleasure, that a subscription has been lately opened *in his behalf*, under the auspices of Sir John Sinclair, Bart., a gentleman well known to you, which promises to secure a suitable reward for the inventor of the thrashing machine, and the members of his family, that remain in an unprovided state. I do myself the pleasure of enclosing one of the subscription-papers; confident that every exertion will be made to fill it up in your neighborhood, so as the last days of a venerable and good man may be rendered comfortable and agreeable.

March 16.—So we cannot have your aid in settling matters with my predecessor. Surely, my dear sir, more than ordinary delicacy is felt, otherwise you would not decline acting as arbiter on my behalf, for no better reason than that I resided twelve months under your protection. The obligation then conferred was on your side, not on mine; and furnishes no cause for supposing that the strictest impartiality would not be exercised, when the duties of an arbiter were to be discharged. However, I am obliged to you for recommending another person for that office, and shall without loss of time wait upon him, and request his assistance.

April 16.—Grass-seeds were sown a few days ago amongst all the fallow wheat upon the farm; and I gave personal attention not only to the sowing of the seeds, but also to the harrowing process, during its whole continuance. My father, when I went to get that business executed, said to me, "George, remember to have the seeds well covered, otherwise an imperfect appearance of plants may be expected. I never saw a headland where the seeds did not vegetate well, owing entirely to the extra harrowing which that part of the field received; whereas, I have repeatedly seen other parts, even of the same field, imperfectly planted from a want of sufficient harrowing." Prompted by these suggestions, I took care that a close double time was given to every ridge; and insisted that the harrows should be driven smartly along, so as the full effects of the teeth, in loosening the surface, and covering the seeds, might be obtained. We sowed 40 acres, part with red clover and rye-grass, for soiling; and the remainder with white, red and yellow clover and rye-grass, for pasturage. A greater quantity of seed were given in the last than in the first instance.

The gentleman to whom you recommended me, undertook at once to act as arbiter in settling the several matters betwixt me and my predecessor.

He seems to be perfectly up to a business of that kind; for when I waited upon him with a copy of the submission, he immediately said, that, with the gentleman appointed on the other side, he would undertake to determine the respective claims in four or five hours. Surprised at this rapid mode of procedure, and knowing of some submissions which had been carried on *de die in diem*, I ventured to hint, that longer time might be necessary, to do justice to the parties. "Oh," said he, in an easy way, "I can readily explain the cause of the delay which you allude to. Those who were acting did not know the business entrusted to their decision, and of course halted at every step. People acquainted with such matters get more cleverly forward, especially if they have been often employed. In short, I pledge myself that a decreet shall be pronounced, at one sitting, upon every article in the submission shown me. Nay, I tell you plainly and candidly, that I have been engaged in more complicated submissions than yours, and spent less time in discussing them than what I have mentioned." Believe me, had not the gentleman been of your recommendation, I should have felt some apprehensions about the issue of the submission; but, recommended by you, every apprehension vanishes.

May 3.—The turnip break is cross-ploughed, and will next week be harrowed, rolled, reharrowed and hand-gathered; after which, the person, employed will give it a third furrow; in which state it must remain till I enter to possession of the farm. I have talked to him about cross-ploughing the plain fallow, and offered 14*s*. per acre if he will plough it nine inches deep. He does not seem averse to the offer, provided he can get on with his own business, which, he alleges, has rather fallen behind during the time he has been engaged with the turnip land. If he declines, I shall look out for some other person, being sensible of the great importance of stirring the fallows at an early period. The dung on the farm appearing to be imperfectly made, I proposed to my predecessor to have it removed from the courtine, or farm-yard, so as it may be properly piled up and mixed together; and offered to provide fillers, if he will furnish horses and carts. In fact, a removal is for both our interests. To him it must prove beneficial, because the dung cannot be accurately measured in its present situation: and to me the removal must be advantageous, because, without it, the dung can neither be properly rotted nor fermented. He has agreed to the proposal; and the removal is to commence on Monday, when all hands will be employed.

May 27.—I have now entered to possession of the farm; that is to say, to the grass and fallow land, and the dwelling-house, cottages and stables. My situation, at present, is certainly not a comfortable one; but in a few weeks, I hope matters will be suitably arranged. I purchased four horses at some roups in the neighborhood, and entered them this day to harrowing the turnip break, so as it might be prepared for a fourth furrow. I mean to set out for Glasgow fair to-morrow, to purchase six other horses; and next week the submission betwixt my predecessor and me is to be discussed. You therefore see that I will not be idle for some time. My father and another friend mean to accompany me to Glasgow; and after our return, you shall hear from me. Indeed, I have already received so much benefit from your instructions, that I would be callous to my own interest, were I to neglect any opportunity of seeking information at a source whence the ignorant may always be supplied without fee or reward. Yours, &c.

Class II.

June 3.—Upon my return from Glasgow market, where I had gone with my father and another friend to purchase horses, I was happy to find a letter from you on my table; more so, as the contents showed that you still retained the same partiality and kindness in my favor, as the tenor of your behaviour, since I had the good luck of being committed to your superintendence and management, had constantly evidenced. Allow me, my dear sir, to thank you sincerely for so many kind and affectionate advices. I shall treasure them up in my mind, and endeavor to exemplify the force of them in my daily conduct. Prudence and integrity are certainly qualities of the first importance. These qualities you warmly recommend, as tending to compensate for many imperfections. Though I may be two young to have full possession of the first, yet I hope the last has never been disregarded. Indeed, upon these two qualities, the real character of every man depends. Without the first, he is a fool; without the latter, he *may* be a rogue;—but, guided by both qualities, his actions must necessarily tend to promote his own happiness and the welfare of society.

But, to come to rural matters.—I am highly gratified by the approbation you are pleased to bestow upon the rotations of cropping submitted to your consideration in one of my former letters. In particular, I am well pleased that my father's observations concerning the increased and increasing benefits from grass-husbandry, are thought worthy of so much commendation. He has been a kind parent all along,—therefore merits from me not only profound respect, but also implicit obedience on all occasions. You justly remark, that the advantages of grass-husbandry will increase in direct proportion with the prosperity of the country, because the general taste of mankind is in favor of the use of butcher meat. This, my father says, is a sound remark, being justified by the experience of many years. He adds, when he commenced farming, that a beast or two, of thirty stones each, with a few half-fed sheep, fully supplied the weekly demand of the neighboring borough; but that now when the wealth of the country is so greatly increased, twenty or thirty beasts, and these of greater weights with a considerable number of well fed sheep, are required to supply the consumpt of the inhabitants for the like period. Indeed, should the wealth of the country increase to such an extent as to allow the lower ranks one meal of butcher meat per day, there is no saying to what length grass-husbandry may be carried. In my humble opinion, however, it should always be connected with corn-husbandry, and never exercised in an exclusive way, as customary in many parts of this neighboring kingdom.

We purchased six good horses at Glasgow market, none of them above six years of age, the average price of which amounted to fifty-five guineas or thereby. In point of expense, a good horse may be as cheap, if not cheaper maintained, than

a bad one; therefore, the work of the good horse being of much greater value, it is for the interest of every farmer that the working stock should be fresh, strong, and capable of performing the labor for which they are intended. If horses are weak and feeble, work, ploughing especially, cannot be suitably executed; of course, either less ground is turned over, or a shallower furrow taken, which is almost the greatest evil which can befal an arable farmer. Indeed, if a weak horse requires as much corn and hay as a good one, common sense inculcates the utility of providing animals of the best quality. My father has always been very particular in these matters; and, I trust, has furnished me with a stock of horses capable of executing every branch of rural labor in the most advantageous manner.

The submission betwixt my predecessor and me, has been signed this day; and the arbiters are to proceed in discussing it to-morrow. They have chosen an oversman and a clerk, and summoned six witnesses, actual tradesmen, whom they mean to examine with regard to the condition of the houses and fences. I understand this is their usual mode of proceeding; and must acknowledge it seems well calculated to expiscate the truth. In that way, they have the whole benefit of the tradesmen's experience, without delegating any part of the power with which they are entrusted. In short, arbiters acting in this manner, may examine as many witnesses as they please, with regard to any particular fact or circumstance submitted to them; while the power of determining or judging upon the weight of the evidence, is still reserved in their own hands. I now begin to discern, that the gentleman to whom you recommended me was not wrong in affirming, that many arbitrations were kept up and delayed, because those employed did not know how to carry them into execution; and shall in my next fully explain the proceedings of the gentlemen appointed to judge of the various matters betwixt my predecessor and me. I expect my father this evening; and shall leave the agency of my claims solely to his guidance and discretion.

June 12.—Since the meeting of our arbiters, I have been so busily employed, as not to find leisure for transmitting, at an earlier period, a detailed account of their proceedings. Such an account may be useless to you, who have so often been employed as an arbiter; but I am sure it will be agreeable to learn, that the whole business was speedily finished; and, what is better, that it was finished to the satisfaction of the parties.

When the arbiters and oversman met, I was called, as incoming tenant, before them, and desired to state my claims against the outgoing tenant. My father, from a written paper in his hand, then stated the claims, namely, repairs of houses and fences; and expressed his desire that it should be formally ascertained, whether the full quantity of grass land and summer fallow was left upon the farm, and whether the clauses which respected management and cropping had been regularly implemented. The arbiters then called for my predecessor, and read over to him what had been urged by my father in behalf of the incoming tenant. To this it was replied by my predecessor, that he believed some repairs were necessary upon the houses and fences, the value of which repairs he was willing to pay; and that, with regard to the other prestations upon him, they were faithfully implemented. Moreover, he stated his claims against me, as incoming tenant, for the value of the land uncropped this season; of the ploughing given to it; and of the whole dung upon the premises. A minute of these matters having been made, the witnesses summoned were directed to examine the houses, and ascertain whether they were in the state and condition prescribed by the lease. Immediately thereafter, the arbiters and oversman inspected the fences, marking in writing, as they went along, the deficiences which appeared. They then desired the outgoing tenant to lead a proof that the farm was cropped, for *three years back*, according to the rules of the lease; which he having done to their satisfaction, the witnesses sent to examine the houses were called; and being interrogated upon oath, deponed respecting the repairs that were required. The dunghills were afterwards measured; and, before dinner, a decreet-arbitral was scrolled, and ordered to be engrossed upon stampt-paper. The substance of which is as follows:

The arbiters and oversman find, that the sum of forty-five pounds thirteen shillings and eightpence sterling will be required to put the houses upon the farm of —— in the condition prescribed by the lease. Find that the sum of eighty-three pounds nine shillings and three pence sterling will be required to put the fences and gates upon the said farm in the like condition; which sums, amounting to one hundred and twenty-nine pounds two shillings and elevenpence sterling, they decern and ordain to be paid, by the outgoing to the incoming tenant, at Lammas first to come, with legal interest from that date, in case of non-payment. Find it established, that the full quantity of grass-land and summer-fallow, mentioned in the tack, has been left upon the farm; and also, that the said farm has been managed and cropped, according to the rules and obligations of the tack; therefore, decern accordingly. Find, that the value of the land left uncropped this year as a turnip or fallow-break, at the rate of three pounds ten shillings per acre, is one hundred and seventy-five pounds; which sum, they decern and ordain to be paid, by the incoming to the outgoing tenant, at Whitsunday next, with interest from that date, in case of non-payment. Find the value o one furrow given to the said fallow to be twelvef shillings per acre; and that the amount of the same is thirty pounds sterling. Find, that the quantity of dung left upon the farm, and produced from the penult crop, is nine hundred and forty cubic yards, but, in respect the outgoing tenant could not reap more than one year's benefit from that dung, find him only entitled to be paid for it as a cottar. Find, therefore, the value of the dung, at the rate of two shillings and sixpence per cubic yard, to be one hundred and seventeen pounds ten shillings; which two sums of thirty pounds and one hundred and seventeen pounds ten shillings, amounting, in all, to one hundred and forty-seven pounds ten shillings sterling they decern and ordain to be paid by the incoming to be outgoing tenant, at the term of Lammas next, with interest from that date, in case of non-payment, &c. &c.

Thus, a business is settled, which gave me at first some uneasiness. The whole expenses thereof amounted exactly to ten guineas, the arbiters having declined receiving any payment for their

trouble. They ordered six guineas to be paid to the gentleman who acted as their clerk, for stamps, and writing the submission; and award one guinea to a landmeasurer who ascertained the quantity of dung; and half a guinea each to six tradesmen summoned as assessors; which sums were paid by my predecessor and me in equal proportions. After business was despatched, the arbiters and oversman did me the favor of taking a share of dinner alongst with my father and the outgoing tenant, together with the clerk and landmeasurer. I find the latter to be a decent and discreet man, an excellent figurer, and one who understands mensuration in all its parts. On these accounts I mean to give him all the countenance and employment in my power. We spent the afternoon agreeably, and did not forget to drink your health. My predecessor behaved very handsomely through the whole arrangement. In short, without showing the least ill-will or spite to me, because I am his successor, he has, from first to last, acted like a gentleman, and as one who knows the world. He has never ostentatiously professed to serve me; but, on the other hand, has as seldom thrown cold water on any part of my proceedings. I am so much satisfied that good agreement betwixt outgoing and incoming tenants is for their mutual advantage, that I mean to meet him more than half-way in every matter which may occur, till his crop is harvested and marketed. In these processes, it is in my power to serve him materially.

The turnip field is now ready for sowing, having received five ploughings, the last across, (which my father strenuously recommended as the best method preparatory to forming the drills), with repeated harrowings and rollings. It is perfectly clean, and completely pulverized; but I am afraid that brairding sap may be scanty, from the severe drought which has for some weeks prevailed. I should have mentioned that one fourth of the field was sown last week with ruta baga and yellow turnips, having, *per* favor of my predecessor, obtained as much dung as was required to supply that part of the field, though the arbiters had neither valued nor measured it. The number of cart loads drove out were ascertained; and it was agreed that each cart load should be considered as containing one and three quarter cubic yards, and paid for accordingly. This is one instance of the benefit which may be done by an outgoing to an incoming tenant; for, assuredly, had my predecessor drawn cross, I could not have got either ruta baga or yellow turnips sown in proper season. My father is a great advocate for yellow turnips, saying, they possess all the qualities of ruta baga, and are much easier produced. He seems to think, that a full crop of ruta baga can only be obtained from ground, either naturally of very fine quality, or which has received a large supply of dung. The advantages of ruta baga are, resistance to the severest frost, and supplying food for cattle and sheep, after common turnips are consumed, and till the grass season arrives. Similar advantages, my father says, may be procured from yellow turnips upon inferior soils, and with less expenditure of manure. These matters, I hope, ere long, to be able to speak upon, from practical experience.

Though the utmost care has been taken to feed the horses well, and not to push them too fast, I find those bought at Glasgow are rather getting into a backward state, being duller in the eye, drier on the skin, and not feeling so plump and mellow as when they were purchased. The horses bought at country roups have not fallen off in the least, though equal work and treatment has been given the whole stock. Shall I attribute the difference of condition to the west country horses not being formerly kept upon the same sort of food as given to them here; or must I suppose, that, at home, they were gently worked, and not used to nine hours per day in plough and harrow, as has regularly been the case (Sundays excepted) since they were purchased? Each of them have got nearly one third of a firlot, or twenty-one pounds weight, of good potato oats, and one and a half Scots stones, or thirty-three pounds weight, avoirdupois, of hay every day since they came into my custody. I purchased the oats at 28s. per boll, and the hay at one shilling per stone; so, of course, the expense of their maintenance has not been less than four shillings per horse per day. I have now begun to give them cutting grass instead of hay, though I do not think it would be prudent to withdraw any part of the corn till the sowing of turnips is concluded.

My establishment (perhaps the term is an improper one, when applied to the servants of a farmer, though used in a pamphlet lately published) consists of my sister, who has kindly undertaken to manage the house till a better manager can be procured, a maid-servant, and a boy to clean my saddle-horse, and perform odd jobs. The ploughmen and laborers are married men; and all of them have behaved steadily and decently since they entered to my service. They leave the stable at five o'clock in the morning, and it generally is half-past ten o'clock before they return; as my orders like your's, are, that the yoking is to commence when they put the plough in motion, not when they go out of the stable-doors. In the afternoon, they leave the stable about twenty minutes before two o'clock, and go four hours after the plough is set to work. Now, when the horses receive grass, the ploughmen have to bring it from the field betwixt yokings, it being cut and tied in bunches by one of the laborers, which, as you often told me, are most saving operations. In fact, where such management is neglected, a great waste and an irregular supply are the necessary concomitants, though, where attended to, the horses are supplied in a regular and economical manner.

June 17*th*.—The sowing of turnips is now finished, and fine dry weather was enjoyed during the whole of the process. I could not, like you, carry on the forming of drills, dunging the ground, splitting the drills, and running the seed-machine, all at one time; but I did the best in my power which circumstances would permit: I formed a considerable number of the drills beforehand, employing three carts in driving out the dung, two ploughs covering it in as fast as it was spread, while, with an odd horse, the drill-machine regularly deposited the seed. I made it a point, that a single drill was not to remain uncovered at the end of the yoking, and took equal care that none were left unseeded; as I hope the best was done under the circumstances of the case. When the drills previously made had been dunged, the whole strength was employed to form additional ones; and, by acting in this way, and paying constant attention

to the work while it was executing, I hope a regular braird may be procured, notwithstanding of the uncommon dry weather which has lately prevailed. I might have mentioned, that two additional laborers were engaged for filling the dung-carts, as one of my own was employed to manage the seed-machine, while the other was cutting grass, and at other jobs. The dung was spread by five boys, who, after the first day, did it very well with light grapes, which I got made on purpose for that operation. At first, they rather appeared to do the work imperfectly; but upon offering a premium of half a crown for the best spread drill, their attention was immediately excited, and a competition ensued, which afterwards was attended with the most beneficial consequences.

The ruta baga and yellow turnips, sown about two weeks ago, have brairded pretty regularly, and must soon be scraped by the Dutch hoe. These were drilled at intervals of two feet, as the plants, not growing so large as common turnips, do not require intervals of the like size. The summer fallow is now to receive the third furrow; previous to which, I mean to harrow and roll it well. Owing to the severe drought, the ground is very dry, and will require the heavy stone-roller to reduce it sufficiently. After rolling, my intentions are to harrow again; then hand-pick all the quickens, &c. that may be brought to the surface; and these operations being over, the ploughs will be entered, and the ground ridged up as expeditiously as possible.

June 30th.—Many thanks to you for the shrewd and kind advices contained in your last. You caution me against keeping much company; alleging, justly, that great expense is not only incurred by such conduct, but that a farmer's mind is thereby abstracted from the regular management of business. On these matters, my sentiments are precisely the same with yours. Indeed, I have often wondered at seeing some of my friends so eagerly set upon giving and receiving visits, as scarcely to have a whole day for the guidance and superintendence of their own affairs; and have entertained doubts, whether such persons were influenced by the enjoyments of the table, or the pleasures of society, to imitate the higher ranks, who, having little or no real business to occupy their attention, are necessarily influenced to devote the greatest part of their time to the enjoyment of social life. The man of business, however, is differently circumstanced. With him every moment is precious. If he spends time in idleness, his private affairs must suffer. His income depends, in a great degree, upon his own exertions; and, if these are weak, irregular, or misapplied, his resources must proportionally be dried up and lessened. Let any man reflect, whether, after spending one-half of the day and a part of the night in company (a custom now too prevalent), a farmer can have the same disposition for business in the morning, as if the preceding day had been spent in following the duties of his profession, and the night in refreshing his body by rest and sleep. Surely he cannot; and, if so, his business must, in one way or other, be thereby injured. Besides, the racket of company is inconsistent with the domestic economy of a farmer's house. It occasions his family to be neglected; throws his household affairs into confusion; takes his servants out of their proper sphere; adds greatly to his expenditure; and, in short, places him in a situation inconsistent with the real welfare and happiness of those engaged in the rural profession.

Mistake me not, by supposing I am hostile to social enjoyment; nor think me so cynical as to condemn every relaxation, as a departure from the rules of regularity and business. No person likes better to see a few friends than I do; and, short as the time is that I have keept house, most of my parochial neighbors have already taken a share of dinner with me. It is not the moderate enjoyment, but the abuse of social pleasures, against which I contend; where visiting is regarded as the chief business; where eating and drinking is considered as the *summum bonum*—and where the principal care of one day is concerning the dinner of the next. Surely I am right in reprobating and condemning such preposterous conduct. Indeed, my sentiments concerning these things were learned at your house. When under your charge, I noticed that the pleasures of society were not disregarded, though, to your praise be it said, the cup was never emptied to the last dreg. Your entertainments were arranged in such a way as not to interfere with professional duties; particularly, I must remark, that, in seed time and harvest, you seldom considered the visits of your friends as a relaxation from business. Nay, if I am not mistaken, you one day declared, that a ticket, at these periods, should be affixed upon every farmer's gate, containing these words, "No admission here." According to your system shall my conduct be squared. I will see my friends with pleasure at convenient periods, and repay their visits in the same way, without considering the business of so much importance as to keep a debtor and creditor account of it. I will constantly endeavor to preserve regular hours; and, above all, avoid the absurd practice recently introduced, of dining at the same hour as the ancient Romans supped. Common sense declares early hours to be best for those engaged in the rural profession. The attentive and diligent farmer will rise equally early with his servants, at least, for a considerable part of the year; but early rising and late upsitting are at utter variance. In short, it is my firm resolution never to sacrifice the duties of one day for the pleasures of another. Having once got into the right road, perseverance will only be required to preserve me from wandering out of it. At my time of life, sedulity and attention to business ought by no means to be disregarded; as inattention to these qualities may engender habits afterwards not easily overturned.

The turnips have not vegetated so regularly as might be wished, though I am inclined to think the plants are sufficiently numerous to make a crop. The ruta baga and yellows are set out, and once horse-hoed. These crops are thriving and regular; and, being the first that I have cultivated on my own account, the sight of them affords me great satisfaction. The fallows are all ridged up, and seem tolerably clean. I am now driving lime for one field which does not seem to have received calcareous matter for many years. I find, that, for prime cost and carriage, the expense of liming will not be less than ten pounds sterling per Scots acre.

July 28.—I took your advice, and shut up the grass fields for a month after my entry to the farm, as they were completely eaten up by the

bestial of my predecessor before his departure. For the first twenty days little difference of growth appeared; which inclines me to think, that the eating of grass land, in the spring quarter, when the weather is cold and blasty, is highly pernicious and destructive. About the end of the month, however, some soft genial rains having fallen, the fields assumed a fine verdure; and a full bite was shortly thereafter obtained. My father sent me half a score of Highland cattle, and recommended, that I should attend some of the neighboring markets, and endeavor to purchase such further stock as might be wanted. Accordingly, I attended the fair at ——— and having pitched upon eight decent three-year old country stots, which might be partly fed in summer, and completed upon turnip in winter, I ventured to request the opinion of a celebrated and well known grazier, concerning their value. His reply mortified me exceedingly, especially as it was delivered so audibly, that one-half of the market might have heard it. "What," cried he aloud, "does the apprentice of the great Mr. Jamieson stand in need of the advice of a hobledehoy like me? Go back to Barnhill, and complete your apprenticeship." Touched to the quick by such a sarcastic reply, I turned about, and left the *gentleman;* and, though dubious of possessing sufficient skill, ventured to conclude the purchase upon the lowest terms that could be made with the seller. Since that time, my father has been here, and assures me that the bargain is a very decent one; which is satisfactory information.

The working horses remain in middling condition, notwithstanding they have been twice each day fed with oats since the turnip sowing was finished. The clover grass is rather getting coarse, which is much against them, and in all appearance it will be fully three weeks, before the second crop is ready for the scythe. I feel the want of tares—an article of horse food indispensably necessary at this period of the year; but next season, shall take care to provide an abundant supply. Where tares are neglected, the deficiency may be made up, by pasturing a piece of the clover field for ten or twelve days, at Whitsunday or the first of June; in which way fresh grass may be obtained, at the time when tares are required. A farmer in the neighborhood followed the plan mentioned; and, at this time, has soft young grass for his horses, whilst mine is hard, coarse and unpalatable. The seasoned horses purchased in the neighborhood, have all along kept in better condition than those brought from the west country.

One of the fallow fields of the thin clay soil, has received dung, and was ploughed thereafter as expeditiously as possible. This field contains 14 Scotch acres, to which 168 carts of dung were applied, and seems to be in excellent condition. I have cleared out the headland and *gau* furrows, in case the usual Lammas flood shall follow; and, if weeds do not appear, mean to sow it with wheat, in the first week of September if possible. Should it take on the slightest growth before that period, I will give another ploughing; though, being well rounded up, I would rather wish to sow it upon the present ridge. The other fallow fields are to be dunged immediately. Respecting this branch of work, the injunctions of my father are very particular. He repeatedly told me when here—"Take out your dung to the fallows about the first of August, or thereby, if practicable; draw it equally out of the cart, and spread it without delay. Plough the land without loss of time after the dung is applied, taking care that an equal furrow is given to every part of it, and by no means neglect to spade and shovel the head land and cross furrows, even though the weather at that time be steadily dry; as a heavy loss, at least a great inconvenience, is often sustained, from a want of attention to these seemingly trifling matters." With the assistance of the stable dung made through summer, I believe we will be able to manure the whole of the fallow. You may likely think that the summer dung will not, at this time, be ripe for use; but I have the authority of the celebrated Mr. Professor Davy, for using *long* dung, which may save me from censure when acting contrary to the established practice.

(To be continued.)

MR. JAMIESON'S FARM.

To the Editor of the Farmers' Register.

As a Scotchman, I feel a considerable degree of interest in the extracts from the agricultural periodicals of my native country which frequently appear in the pages of the Register; and the "Letters from an agricultural apprentice to his father" copied from the 'Edinburgh Farmer's Magazine,' which appeared in the numbers of the Register for Sept. and Oct. have been peculiarly interesting, from the strong conviction on my mind of my having in early life known the farm, the management of which these letters so well describe. The name of the farm, the farmer, Mr. Jamieson, and at least two of his managers (Elliot and Fairbairn), together with the whole tenor of these letters, convince me that I am not deceived. The farm to which I refer is situated in Roxburghshire (Scotland) on the south bank of the river Tweed, a few miles from the market town of Kelso, and had been formed by the junction of a number of small holdings or farms, and consisted of upwards of two thousand acres. The junction of these farms had taken place before I can remember; but I have often heard comparisons made between the comparatively unproductive state of these farms before their union, and the high degree of fertility to which they subsequently attained, after being united and occupied by a wealthy, enterprising, and systematic farmer. The place of my birth was two miles lower down the same bank of the Tweed from this farm. My father left that part of the country when I was very young, making however annual visits to his relatives in that neighborhood, in which I frequently used to accompany him. The last time I was on this farm was in the autumn of 1824. It was then in the occupation of a new tenant, paying a yearly rent of £8000. Harvest was at the time of my visit nearly completed; I however counted 140 shearers (reapers) in one field of oats. I had also an opportunity of seeing the stack-yard just after the stacking of the grain was completed. A more imposing agricultural spectacle I believe I never witnessed. The number of stacks I do not now recollect; they were certainly not under one hundred, ranging in parallel rows, and raised from the ground on short pillars, large, and finished with the greatest degree of neatness. I have

oftener than once traversed the principal agricultural districts of Scotland south of the Grampian hills, and in which I have seen many well and neatly conducted farms, but none equal to this in magnitude, or surpassing it in neatness. The change of occupants had also made some alteration in its management. Naked fallows had been nearly if not altogether abandoned. Turnip husbandry had been greatly increased; and these consumed on the land by sheep. Every thing however evinced the best of management. The same bell summoned the laborers to their work; and all the minutiæ of good management and division of labor appeared to be as strictly attended to as in the time of its former systematic occupant.

ANDREW NICOL.

Coggin's Point, Nov. 8th., 1839.

IMPORTANT TO FARMERS.

From the Sangamo Journal.

There are few of our farmers who have not witnessed the effects among cattle of a disease known as the *mad itch*. It has sometimes carried off the most valuable stock; and all efforts to arrest the disease appeared to be useless. We think we can now lay before our stock raisers a remedy for this disease. It was discovered by Mr. David Simms, a farmer, living on Lake Fork. Considering it valuable to the public, he has handed us the annexed notice of it for publication. We would suggest to our farmers to preserve it, as it may prove of more value to them than the amount they would be required to pay for a dozen volumes of the Journal:

To the Editor of the Sangamo Journal—

The undersigned takes this method to inform the farmers and all those who raise cattle, that he has discovered a cure for the mad itch, a disease which is often fatally destructive to that species of stock. Last winter was two years, when I had four cows attacked with the above complaint, and I tried every thing I could think or hear of, to cure them, but with no good effect. This winter another of my cows took the same disease, which I discovered early one morning; and as soon as I discovered it, I gave her as much soot and salt as she would lick, and in a few hours after, I gave her from three quarters of a pound to a pound of pulverized brimstone. In the morning following, I gave her as much salts. The cow is now well, and is as hearty as any of my cattle. It is my opinion that sulphur itself will cure, or sulphur and salts given in the way prescribed. The cure was effected in about a week. The remedy operates severely for two or three days as a purge.

To those who are not acquainted with this disorder I will inform them that it first comes on with a kind of hiccoughs or jerks at every breath. The brute jerks itself full of wind; frequently licking their sides and back; occasionally rubbing their heads; and if not stopped, in five or six hours they rub with apparent madness, and continue to swell until death takes place which will be within about ten or twelve hours after the attack.

This cure is from experience, and I give it for the good of my fellow-citizens.

DAVID SIMMS.

Logan Co., 15th March, 1839.

For the Farmers' Register.

THE WEATHER IN TROPICAL FLORIDA, DURING THE SEMINOLE WAR.

Abstract from the Meteorological Register, kept at Indian Key, Tropical Florida, by Charles Howe, esq., P. M., and inspector of the Port. Thermometrical observations made at sunrise and 2 P. M., each day.

	The coldest day at sunrise.	*The hottest day at 2 P. M.*	*The greatest variation in one month.*	*The greatest variation in one day.*	*The least variation in one day.*	*No. of days in which rain fell.*	*No. of inches of rain fall'n monthly.*
1836							
January	54	77	23	9	0	1	2.
February	50	81	31	11	0	1	0.64
March	60	80	20	9	0	3	2.50
April	71	83	12	5	0	4	2.
May	75	84	9	6	0	5	6.50
June	78	88	10	8	0	4	3.50
July	77	86	9	4	0	3	5.34
August	80	86	6	6	0	4	1.69
September	80	86	6	4	0	13	0.90
October	74	85	11	4	0	2	3.86
November	62	80	18	7	0	1	1.22
December	60	78	18	10	0	0	0.
1837							
January	50	84	34	11	2	6	3.72
February	51	80	29	10	1	3	1.10
March	59	82	23	10	1	1	0.09
April	65	86	21	9	2	3	2.
May	72	88	16	10	0	3	0.90
June	76	90	14	9	2	2	3.10
July	79	90	11	7	0	4	4.70
August	78	90	12	6	2	5	6.75
September	79	88	9	6	1	3	8.25
October	61	88	27	6	1	5	8.75
November	61	87	26	9	0	2	6.10
December	62	84	22	9	2	3	2.12
1838							
January	64	82	18	7	1	1	0.20
February	50	83	33	14	2	2	0.06
March	62	82	20	10	1	1	0.30
April	64	84	20	11	2	1	1.08
May	70	87	17	10	2	3	2.40
June	76	88	12	8	0	6	7.
July	80	90	10	7	2	1	2.40
August	82	90	8	6	2	2	3.
September	78	89	11	6	1	8	7.10
October	68	86	18	10	0	5	6.22
November	67	84	17	8	0	3	7.10
December	63	84	21	12	0	3	2.60
1839							
January	54	80	26	12	0	2	0.08
February	61	84	23	12	1	4	0.12
March	59	84	25	10	1	1	0.02
April	58	87	29	12	2	4	3.
May	76	88	22	9	0	11	6.90
June	79	90	11	6	2	8	4.50
July	80	89	9	7	2	8	7.60
August	81	89	8	7	1	6	2.60
September	78	88	10	7	2	4	6.50
October							
November							
December							

General Results.

	1836	1837	1838	Oct. 1st. 1839
No. of clear days in the year	289	290	314	210
" of cloudy " " "	35	35	15	15
" of rainy " " "	41	40	36	48
Extreme hottest day "	88°	90°	90°	
" coldest " "	50°	50°	50°	
Greatest change in 1 month	31°	34°	33°	
Greatest change in 1 day	11°	11°	14°	
Number of rainy days in each rainy season, from June 1st, to October 1st, each year	24	14	17	26

That is, the number of days on which showers fell; because there is never an entirely rainy day; and because the showers mostly fall by *night*.

N. B.—In the first nine months of the present year, it should be noted that the showers have been uncommonly numerous, and have occurred at unusual times. H. PERRINE, M. D.

Indian Key, October 15th, 1839.

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To the Editor of the Farmers' Register.

Indian Key, Trop. Fl. Oct. 15, 1839.

SIR—I gladly transmit to you an abstract of the Meteorological Register kept at this islet during the whole period of the Seminole war, by Charles Howe, esq., P. M., and inspector of the Port. These undisputable evidences of the usual weather in Tropical Florida ought to demonstate that, *in South Florida*, military hostilities against the savage Seminoles could have been continued throughout the whole summers as well as at all other seasons of those years, from the first of January, 1836, to the first of October, 1839. You know, that the highest official authorities of the republic have adopted the deadly "opinion," that the territory of Florida is cursed with a "deadly climate;" and that the most vital interests of the nation must continue to suffer from the continuance of this "deadly opinion." As a physician, then, it has become my duty, 1st, to re-affirm boldly the positive fact that below 26°, South Florida, with its peculiarly tropical atmosphere, enjoys the most healthy climate in the United States; 2nd, to announce strongly the additional fact, that South Florida, *with its exclusively calcareous earth*, possesses also the *most healthy soil* in the United States; and 3rd, to invite earnestly my medical brethren to publish speedily every fact, and every argument which can be brought or which may be thought to show that either in climate or in soil, South Florida is not the healthiest district of the union!!

Very respectfully,
Your ob't. serv't.
HENRY PERRINE, M. D., &c.

P. S.—The Meteorological Register, above, will demonstrate to every intelligent physician, the unrivalled healthiness of the tropical climate of South Florida; and to every comparing observer, the unrivalled delightfulness of its equable weather at all seasons of the year! H. P.

CONTRASTED CLIMATES OF SOUTHERN FLORIDA AND OF SOUTHERN MISSISSIPPI.

To the Editor of the Farmers' Register.

Having noticed in the 'Journal of the American Silk Society,' at page 152, a paragraph headed "Climate of Mississippi," which appears to contain the general results of observations on the weather made in Natchez, I suggested to one of my children the expediency of making a similar compend from the meteorological registers of Indian Key for the same years of 1837, 1838, kept by Charles Howe, esq. Although I practised medicine myself in the neighborhood of Natches, from June 1824, to March 1826, the *contrast* between the two climates of southern Mississippi and southern Florida appears so very extraordinary, *even to me*, that I think it merits to be presented to the public in general through the pages of your Register, in the form of the parallel tables here subjoined. Respectfully, &c.

H. PERRINE.

Indian Key, T. F. 1st Oct. 1839.

1837	Natchez, Miss.				Indian Key, T. F.
Clear days	95	-	-	-	290
Cloudy -	166	-	-	-	35
Rainy -	93	-	-	-	40
Foggy -	4				
Hazy -	5				
Snowy -	2				
Coldest day, at					
6 P. M. Jan.,	28°	At sunrise, Jan.,			50°
Hottest day, at					
6 A. M. Aug.,	93½	At 2 P. M. July,			90°

1838	Natchez, Miss.				Indian Key, T. F.
Clear days	43	-	-	-	314
Cloudy -	193	-	-	-	15
Rainy -	93	-	-	-	36
Foggy -	27				
Hazy -	5				
Snowy -	3				
Sleety -	1				
Coldest day at					
6 A. M. Feb.,	18°	At sunrise, Feb,.			50°
Hottest day at					
6 P. M. June,	94°	At 2 P. M. July,			90°

NEW SPECIES AND NEW VARIETIES OF THE ACTUAL STAPLES OF THE OLD SOUTHERN STATES.

To the Editor of the Farmers' Register.

In my official letter to the Hon. Secretary of State of the U. S. A. dated at Campeachy, 9th December, 1834, the following sentence was incidentally introduced. "Were there however no other motives for an acclimating nursery in Tropical Florida than the domestication of such species and varieties of rice, tobacco and cotton, as are peculiarly valuable in peculiar soils, and of such as will flourish in sites and seasons where and when the actual species or varieties would perish, such an establishment should be encouraged on that account alone." The above extract is transmitted for the effective consideration of the enlightened planters of the south, because your pages contain notices of two new species or two new varieties

of cotton, which already have *been casually* introduced; and because I am persuaded that still more valuable species or varieties may be immediately domesticated in Tropical Florida, and thence gradually acclimated throughout all our southern states. We are told, by Thomas Spalding, that our celebrated sea island cotton was first procured from the small island of Anguilla, and domesticated in the Bahama islands; and that from the *arid rocky* soils of the Bahamas it was introduced directly into Georgia in 1786. We are further told that his father planted his *Anguilla-Bahama* cotton seed in the spring of 1787 upon the *banks* of a small *rice* field in St. Simon's island; that the land was *rich* and *warm;* that the plants grew *large* and *blossomed*, but did *not* mature their fruit. That nevertheless *the plants grew from their roots* the following year, and *matured their bolls;* that the difficulty was then over; that the cotton adapted itself to the climate; and that every successive year from 1787 saw the *long staple cotton extending itself* along the shores of Georgia, and into South Carolina. By the letter of the same gentleman it appears, that subsequently "every variety of cotton that could be gleaned from the four quarters of the globe has been tried; but none of them, but *one*, has resulted in any thing useful;" that the *Bourbon* cotton grew and blossomed, but did not ripen its fruit, and perished in the winter; that the *Siam* cotton grew large, was of a *rich purple* color both in *foliage* and *blossom*, but *perished* also without ripening its fruit. "The *kidney seed* cotton (that is, a cotton which produces the seed *all clustered together* with a long strong staple extending from one side of the seeds, and which I believe to be the Brazilian or Pernambuco cotton,) was tried, and was the only new species upon which there could have been any hesitancy; but this, too, was given up, because *not* as *valuable* and not as *productive*." As the last phrase is comparative, we should infer that Mr. Spalding meant that the *kidney seed* cotton was not then as valuable or as productive as the *sea island* cotton when raised on the same warm *rich soils*. But by the 'Southern Agriculturist,' of December, 1838, we see, that *now* the southern planters say, that at even from 70 to 80 cents per pound for sea island cotton, its culture is less profitable than the raising of the *hardy* and *productive* kinds of *common cotton;* that its average price in Liverpool from 1830 to 1835 was only 17¼ pence; and even during 1836-7 rose only to 25 pence, and that the average crop of 1837 was only 76 pounds per acre, and in 1838 would not probably exceed 64 pounds per acre. Has not therefore the period arrived when it is desirable to give the kidney seed cotton *another trial*, not on the *moist rich* soils adapted to the sea island cotton, but on the *driest poorest soils* of the *old* southern states? (In asking this question I wish to be distinctly understood that *I have no seeds* of any kind for sale, and very few for exchange. No person who understands my past history, and my present circumstances, will suspect me of either the capacity or the desire to engage in any pecuniary speculation; but the writers on the manilla mulberry have caused their readers to be distrustful of every agricultural novelty.) On my first arrival at Campeachy in 1827, I was shown, in the yard of Colonel Toro, a shrub of the kidney seed cotton, which was still bearing cotton on my last departure in 1837. Dr. Corroy, of Tobasco, a small state adjoining Yucatan, informed me that the same perennial shrub continued to yield cotton abundantly during eight months of every year. Under date of the 12 h of January, 1834, at Campeachy, I noted "the pods are so numerous and so heavy that they bend the branches towards the ground like an over-loaded peach tree." Under date of 5th of December, 1835, "I have collected some ripe pods. It is a custom here to cut down the stems in May in order to have new shoots during the rainy season." I continued to send seeds every year to many ports of the United States, but never received any accounts of any trials made with them. Finally in the spring of 1833 several seeds from Campeachy, via Havanna and Key West, were so lucky as to reach Cape Florida; and in that vicinity, I am informed, that their progeny are still propagating themselves. Indeed on the 16th September last, while on a brief visit to Big Pine Key, south-west of Cape Sable, a Mr. Williams showed me a shrub of the kidney seed cotton growing there, which sprang from seeds given to him by Mr. Dubose, the former keeper of the light house at Cape Florida, to whom my seeds and plants from Yucatan were intrusted. To guard against all contingencies however, I brought fresh seeds with me to Indian Key in July, 1837, of which some were sown in August, in a single box not containing more than a cubic foot of earth. On my return to this islet, the 25th December last, I found six strong stems growing in that single box, the branches of which were covered with ripening pods; and on the 7th of February, 1839, the first boll of mature cotton was picked by me; and on the 11th it was sent (by the schooner Hope for Charleston, S. C.) to the Hon. H. L. Ellsworth, commissioner of the Patent Office at Washington. *Suffice these details to prove that the perennial kidney seed cotton of Yucatan is now permanently domesticated in Tropical Florida!* I have previously notified you of the fact that while at Northampton, Mass., during September, 1838, I obtained a few seeds of an apparently *silkier* variety of the kidney seed cotton, brought by a Mr. Peck from the Sandwich islands; that one of the Sandwich seeds, sown in a tub of earth on the 19th July last, had grown by the 11th September to the height of nearly two feet, and was then discovered to have five flower buds; and, I now add, that the first blossoms opened the 23rd September, the 2nd the 25th, 3rd the 27th, the 4th the 30th, the fifth blossom on the 2nd October, the sixth on the 5th. A record of these details will be appreciated only by those who can imagine the great results to our southern states, which may ensue if this single plant shall mature its wool and seeds in the short period of time which will enable it to be cultivated as far north as the common annual cotton. One object of my ambition is to have a few plants of every species and variety of cotton growing in the same nursery. This desire is not founded on the mistaken opinion that any kind of capsular fibres can ever be produced as profitably as foliaceous fibres, in Tropical Florida. It is very evident that no annual plants can ever be profitably cultivated on a large scale, *on any* of these *arid rocky keys*. 1st. Because they will not admit the labor saving agency of the plough. 2nd. Because they are composed of the single element of carbonate o lime, and as the scanty substance, here called soil,

consists solely of fine calcareous powder colored with a little vegetable mould, it is *destroyed* by a *few years exposure* after clearing; for the mould is soon decomposed by the sun, and the powder is blown away by the wind. Yet for the same reason, that the perennial *silk* shrubs are adapted to small cultivators on these rocky islets, the perennial cotton shrubs, and the perennial hemp plants, are also adapted to both. But my desire to have every species and variety of cotton in a tropical nursery are founded on the opinions of their ultimate utility to the poorest soils of the southern states, expressed in the cited paragraph to the Secretary of State. Had such a nursery existed 50 years ago, when every variety of cotton was gleaned from the four quarters of the globe, what imagination can calculate the probable results of their preservation, propagation, selection and improvement, to the present date! The *Bourbon* and the *Siam* cottons would have had another and repeated trials, until they too, like the sea island cotton, might have adapted themselves to different climates and soils of the southern states. Indeed the principal causes of the general failures in all first trials to acclimate tropical plants may be traced to the general practices of planting and protecting them in *warm and rich soils.* In Mexico, in the state of Vera Cruz, near the village of Cosomoloapam, there grows a *rose colored cotton*, which Don Domingo Barret, of Campeachy, assured me he had personally seen; but although during several years I offered a doubloon for a single pod, I was never able to obtain a single seed. From Campeachy I frequently transmitted to different ports of the United States the "Algodon de vejuco" or reported *vine cotton* of the stony hills in the interior of Yucatan; but know nothing of the results, unless they were contained in the following paragraph of the 'New York Evening Post' of August 12th, 1835, extracted from the 'Charleston Courier,' "Productive cotton. Two very fine specimens of a sea island cotton, grown on James Island, have been left at this office for inspection. This plant shoots up in a kind of *vine*, and is *exceedingly productive*, as testified by the numerous blossoms and pods which the specimens before us exhibit." As the first parcel of these *vine* cotton seeds were the only ones that I could obtain from the interior of Yucatan, the balance brought with me to Florida in 1837, had probably lost their vitality during the intervening years, because not a single seed has yet germinated, although I have made many trials. As the introduction and propagation of tropical plants *direct* from the tropics, cannot be accomplished by either private individuals or chartered companies so long as even our armies cannot afford protection to the persons or pursuits of agriculturists in southern Florida, and so long as ports of entry be not established at or near the southern extremities of the peninsula, my time can be usefully employed only in making a miniature collection of the very few tropical plants or seeds, which may be obtained by the only opportunity offered by the monthly mail packet from Charleston, S. C. I therefore respectfully suggest to the intelligent planters of the south the propriety of speedily procuring and transmitting to me a dozen seeds of each species and variety of cotton, for which I will return to them any equivalent in my power. As the very enlightened Commissioner of the Patent Office has practically commenced an agricultural department by affording facilities for the collection and distribution of valuable seeds throughout the United States, the *trouble* of transmitting to or receiving from me a *few seeds* will be very *slight* indeed; as it will consist solely in first superscribing the small package "to the superintendent of the Tropical Plant Company, Indian Key, T. F." and then enclosing it in an envelope directed to the "Patent Office, Washington, D. C." Very respectfully,

Your ob't servant,

HENRY PERRINE,

Sup't. T. P. C.

Indian Key, T. F., 5th Oct., 1839.

REAFFIRMATION OF CHARGES IN DR. PERRINE'S COMMUNICATION.

To the Editor of the Farmers' Register.

Indian Key, T. F., Oct. 15th, 1839.

In your August No. at p. 473-4, I perceive, over *two names*, the irrelevant attempts to impeach the *phraseological* correctness of *two words* contained in a few forbearing lines, (on p. 354-5 of your June No.,) *which cannot ever be fairly disproved.*

On these self-exculpating, self-implicating papers, of offending and offended individuals, I merely remark that they do not even indirectly deny the main fact of *gross neglect of official duty;* and I briefly add, that a recent outrage personally perpetrated by the primary defendant, having been formally communicated to the Hon. Secretary of the Navy, the sub-officer should soon have an *official* opportunity for official disproval of any official misconduct ever alledged by me.

Very respectfully,

Your ob't. servant,

HENRY PERRINE.

CORRESPONDENCE ON THE PRESERVATION OF TROPICAL PLANTS.

[Communicated for the Farmers' Register.]

War Department, July 13th, 1838.

Sir—This will be handed to you by Dr. Perrine, who repairs to Florida with a view to the accomplishment of important and interesting objects, which he will make known to you. Such aid and facilities as you may be able to extend to this gentleman, without any interference with the particular duties with which you are charged, under the direction of this department, I will thank you to grant him. Very respectfully,

Your most ob't. servant,

J. R. POINSETT.

Lieut. J. T. McLAUGHLIN,
Commanding Schr. Wave.

Circular to the Officers and Agents of the War Department, in and near the territory of Florida.

Such officers and agents of this department in and near the territory of Florida as the bearer Dr. Perrine may present this paper to, are hereby requested to extend to that gentleman all the aid and facilities that may be in their power, and that will

not interfere with the interests of the public service, towards the accomplishment of the objects he has in view, and which he will make known to them.

J. R. POINSETT.

War Department, July 13th, 1838.

To Col. Harney, U. S. A. at Cape Florida.

Indian Key, T. F. 3rd May, 1839.

SIR—I have the honor to send you a copy of a circular from the Hon. Secretary of War with the simple request for the negative aid that you will *not permit any person* to extract any valuable plants from the vicinity of Cape Florida, without a written order from the undoubted owner of said plants; especially any near the lighthouse, or at the improvements of John Dubose, near the falls of the Miami river, or at the improvements of his sons Elias or John, on the bay.

Very respectfully,
Your obedient servant,
HENRY PERRINE,
Superintendent of the T. P. C.

To the Editor of the Farmers' Register.

I respectfully transmit to you the copies of the special letter and general circular of instructions of the Hon. Secretary of War, and the copy of the only written request, ever made under the general circular, to Col. Harney, of the United States Army, at Cape Florida. Under these conditional instructions I have barely entertained only two humble hopes. 1st. To remove a few plants from a few spots in the destructive possession of redmen. 2. To preserve the same plants in the same spots from the destructive power of white men. The date of my letter to Col. H. shows the end of my *first* hope, and the *beginning* of my *last* hope. Up to the present date those kind instructions have resulted in *nothing*. These brief facts are submitted to the spontaneous comments of all intelligent readers over forty years of age, who have had much experimental knowledge of the subordinate workings of governmental machinery in distant deserts. Such readers will also readily conceive the sad details which prove the utter impossibility of effecting any agricultural improvement in south Florida by the fettered exertions of private individuals, or by the combined funds of chartered companies, so long as even the armies of the United States cannot afford any protection to the persons or pursuits of agriculturists on the mainland by repulsion of the savage Seminoles from the southern coast; and so long as the government of the United States does not remove its own governmental obstacles to individual industry by opening ports of entry near the southern extremities of the peninsula. And such readers will moreover duly reflect on the important fact that ever since the creation of our government, we have never had, in any cabinet, a single member, who, by a long residence in tropical regions, could have become thoroughly qualified to appreciate properly the great national importance of the speedy domestication of tropical plants in southern Florida, with the single exception of the actual, enlightened Secretary of War.

Very respectfully,
Your obedient servant,
HENRY PERRINE.

Indian Key, T. F., 22nd Oct., 1839.

THE PECULIAR CALCAREOUS SOIL OF SOUTHERN FLORIDA, AND ITS EFFECTS ON HEALTH.

To the Editor of the Farmers' Register.

Indian Key, T. F. Oct. 19, 1839.

DEAR SIR—By the paragraph appended to the meteorological abstract, you will perceive how greatly I am indebted to you for the important explanation of the admirable fact of the extreme healthiness of the *exclusively calcareous soil* of Tropical Florida. Shortly after the reception in May last, of your unrivalled 'Essay on Calcareous Manures,' I informed you that the first perusal of that invaluable work had opened to me a new world of observation and inquiry. I had never previously reflected on the importance of the extraordinary fact, that nearly all South Florida composes one vast bed of the most celebrated mineral manure of the northern and southern states of the union. I had never duly reflected on all the bearings of the important fact that all the calcareous earth of South Florida is the great manuring earth of the whole civilized agricultural world; and hence, I could not completely appreciate your high estimates of the immense value of carbonate of lime, to improve the exhausted soils of the old southern states. But, I can now readily concur in the positions repeated by you, at page 511, of your August No., in your remarks on the Agricultural Convention of South Carolina—that the judicious addition of a little calcareous earth to their present unproductive soils would increase their productive powers, many-fold in a few years. I perceive that, in Massachusetts, Professor Hitchcock has discovered and asserted, "1st, the grand desideratum in our soils, is calcareous matter, that is, carbonate of lime; 2nd, without lime in some form, land will not produce any valuable vegetation; 3rd, that the failure of a whole crop may result from the deficiency of one per cent. of some form of lime in one hundred parts of soil." Although silex and alumina are the great constituents of this terrestrial globe—although lime does not constitute more than one-eighth or one-tenth part of even the crust of this globe—although silicious and aluminous earths principally compose the visible earths of its surface—yet, as you have well shown, the smallest proportion of calcareous earth will form the most important constituent of every agricultural soil. While silex and alumina may be denominated in common, the simple, elementary, mechanical earths—while silex alone may be called the separative, loosening, uncohering, unabsorbing earth—and while alumina alone may be distinguished by the epithets of the adhering, compacting, absorbing earth—and while, hence we attribute the agricultural properties of these two elementary earths, to their mechanical properties above—we are obliged to superadd many distinctive epithets to designate the many important properties of calcareous earth—we must call the carbonate of lime, a compound elementary earth, a chemico-mechanical earth—a medico-alimentary earth—because the sandy and clayey earths are improved with the calcareous earth, by the combination of mechanical, chemical, medical and alimentary properties in the same natural form of carbonate of lime. Hence, (Q. E. D.) the slandered, arid, rocky, sandy keys of Tropical Florida, are entirely composed of the most valuable

agricultural earth of the world. But I did not take up my pen to show either by theory, or by fact, the vegetable productiveness of these arid calcareous soils. In your own Register, for October 1835, at p. 335-6, your own pen has shown "the fertility produced on them by irrigation," and that hence, boring for fresh water, is the only desideratum for the vegecultural prosperity of these arid calcareous islands. But, my great object is to sustain the irrefutable healthiness of the arid calcareous soils of all Tropical Florida. My great object is to show that this irrefutable fact of the great healthiness of the soil was long since satisfactorily explained by your chapter 19th, on the properties of calcareous earth to preserve the purity of the air, and the health of mankind.

The only intelligent observers who have made any reports concerning South Florida, all concur in the facts that the whole subsoil of South Florida is a soft calcareous rock, that the whole surface of the Florida keys is composed of exclusively calcareous materials; that, in short, whether the substances are called coral or limestone rocks, shell, or coral sands, blue, or white marls, they are all solely carbonate of lime. I now add the momentous fact, that the only scanty substance, here called soil, is barely fine calcareous powder, colored by a little vegetable mould; and I superadd the inevitable result, that this scanty soil must necessarily be entirely destroyed by a few years exposure; because the mould is decomposed by the sun, and the powder is dispersed by the wind. Indeed, a moment's reflection will convince you that we cannot here ever have any noxious excess of vegetable remains, either by their increase from natural deposition, or by their accumulation from watery transportation. Suffice these facts to demonstrate to you that the soil of South Florida must be the healthiest soil of the union.

Very respectfully,
Your ob't. serv't.
HENRY PERRINE.

P. S.—Suggestions for the consideration of the editor of the Farmers' Register. 1st, republication of the letters of Gen. H. A. S. Dearborne to the Hon. Levi Lincoln, and to Dr. H. Perrine, concerning the introduction of tropical plants into South Florida, which are published in the Journal of the American Institute of the city of New York, in the numbers of the last summer (1838); 2nd, republication of the able article on the introduction and culture of the tea plant, probably written by Doctor Dekay, after his visit to the tea plantation, near Rio Janeiro in Brazil, and published in the New York Farmer for 1828, at pages 105, 106 and 107; 3rd, condensed publication of all the striking facts developed and published by you, on the properties and uses of carbonate of lime; 4th, an equally interesting abridgement of all that has been known and shown by you, relative to the importance of irrigation. It strikes me that the Southern Agricultural Convention should appoint a special committee to consider and report on the advantages and expediency of improving all their poorest soils by *calcarbonating* them; and for that purpose the committee cannot find any text book as valuable as your comprehensive 'Essay on Calcareous Manures,' which, by the by, I consult every week. Next in importance, for improving their poorest soils, it seems to me, would be the appointment of another special committee, to report on the advantages of irrigation in all the old southern states; and for this subject too, I presume the committee will find the amplest materials in the back numbers of your Register.

H. P.

THE ALMOST PURELY CALCAREOUS SOIL OF TROPICAL FLORIDA.

We received from Dr. Perrine a specimen of the calcareous earth which forms all the "keys" or islets of the Florida reef, and which also, barely colored with vegetable or other organic matter, constitutes the entire surface soil of these islets, and, principally of the neighboring main-land. The specimen sent is from the flats surrounding Indian Key, which are left naked at low tide, several hundred yards in width. The whole bottom of that part of the Mexican sea, is doubtless composed of the same earth, as well as the now higher and dry lands, which has been raised by some ancient convulsion or operation of nature, from its former position at the bottom of the sea. This calcareous earth is not (as we had supposed) the coral rock formed by the construction of insects; or, if so produced originally, it has been broken down and pulverized by natural causes, and the parts again consolidated into a very soft rock, softer than English chalk, to which in whiteness and in purity it nearly approaches. The mass contains many small shells, showing that they had been enveloped in a soft and semifluid earthy deposite, while under water. The specimen contained 92 per cent. of carbonate of lime. The small remainder was of fine dark-colored clay, containing little if any silicious earth.

Another specimen of the soil (or sub-soil, perhaps,) of the main-land near the southern extremity of the peninsula of Florida (nearest to Indian Key,) received from the same source, contained 81 per cent. of carbonate of lime.

Thus it appears that the entire body of soil (if soil it can be called) of this extensive and very remarkable region is composed almost exclusively of the very substance which is almost universally and entirely deficient throughout the lands of all the great Atlantic slope, from the St. Lawrence to the Savannah. And, if not understood and remedied, the superabundance of calcareous earth in the one case, is as sure to cause and maintain sterility, as its total absence does in the other. The most barren earth of each of these great regions would be the best of manures for the other; and hereafter vessels will be profitably employed in thus exchanging these earths, which though worse than worthless in their native position, become rich manures, and the producers of permanent fertility, by merely exchanging places.

Dr. Perrine is correct in his supposition that after a short course of tillage, the present small productive power of these excessively calcareous soils will be destroyed and lost; and then they will probably remain for ever after barren, naked, and uninhabitable "sand banks," which designation is already applied by unobservant or ignorant voyagers to some of these islets which scarcely have a grain of sand in their composition. Knowledge of the subject of calcareous manures and earth would be scarcely less important for this peculiarly calcareous region (and also the southern prairie lands in general,) where the abundance of this earth is the greatest evil in the soil, than in the other great region where it is altogether wanting, and to obtain it, is the great desideratum for the defective soils.

The suggestion made in the foregoing communication of the need of a "condensed publication of all the striking facts developed and published on the use of carbonate of lime," has before been under consideration. The object will hereafter be best reached by another and much extended edition of the 'Essay on Calcareous Manures,' in which will be embraced all the interesting and valuable facts which have been observed or established since the publication of the last edition.

—Ed. F. R.

GEARY'S PATENT COAL.

From the Mechanics' Magazine.

The formation of an artificial fuel has for some time past occupied no small portion of the attention of scientific minds. The high price of the natural mineral—the great space it requires for stowage—the quantity of its refuse and the nuisance of its smoke, were amongst the disadvantages which it was sought to be overcome by some artificial combination of combustible matters. We have from time to time published accounts of the various patented methods of manufacturing artificial fuel and coal, and of various experimental usings thereof for steam engines and other purposes, to which we have now to add, the particulars relating to another composition invented by Mr. Stephen Geary the architect.

Mr. Geary's artificial coal consists of a mixture of the following ingredients:—First, about half of small coal, or coal-dust; second, pitch, or bituminous matter obtained from coal, or other mineral or vegetable tar; third, coal or coke cinders, powdered peat, or bark of trees, sawdust or tan; fourth, powered clay, freestone, chalk, plaster, earth, sand, or other earthy matters; and lastly, about a fortieth-part of some acid—sulphuric acid, as the cheapest, is that which is used by Mr. Geary.

The coal is manufactured in the following manner:—The pitch is to be melted in a pot, and the cinders gradually introduced—stirring constantly. The powdered clay is next to be added gradually, then one-half of the small coal; as soon as these matters are well amalgamated—being kept at a good heat during the operation—the acid is to be poured in, and well stirred through. An effervescence will in a short time take place, producing a froth on the surface of the mixture; and as soon as this appears, add the remainder of the small coal. The mixture of the ingredients having been completed, the fluid mass must be kept in a state of agitation by stirring until the whole is well and equally heated. The mixture may then be run into moulds of any desired shape. When the mixture has become partially cool, pressure or beating may be applied in order to compress the blocks of fuel into as small a compass as possible. The pressure or beating is not essential, except in cases where the coal is intended to be used as steam-boat fuel, where stowage room is valuable.

The ingredient in this composition, which is new, and from the action of which on the other component parts, the beneficial qualities of Mr. Geary's fuel result, is the *acid*; and he claims this addition of an acid or acids to the other matters which have all been used before, as constituting his patent.

Some specimens of coal thus manufactured were submitted to Professor Brande for his examination and opinion, who reported as follows:—

"That it burns well, kindles readily, and has most of the characters of some of the bituminous coals. It undergoes combustion rather more rapidly than the ordinary Newcastle coal, but appears to give out as much heat and to form a brisk, agreeable, and efficient fire, and I apprehend no objection to it on the score of smell, dust, smoke, soot or ashes, and it is entirely free from any quality prejudicial to health.

"I have no doubt that it might be available in the manufacture of gas and coke, but whether economically or not is a question which I have no means of determining.

"Accurately to ascertain the relative value of this fuel, as compared with the ordinary varieties of coal, would require a series of experiments upon a larger scale than I have been enabled to undertake, but from the trials which I have made of it, it appears to me to compete with the superior kinds of coal, and if so, the greater number of its applications to inferior purposes are matters of comparatively little moment."

Mr. Squire (chemist in ordinary to her Majesty) also reports very favorably of its merits in the following terms:—

"I have examined the properties of the patent coal, which you placed in my hands for that purpose, and have to report that it makes a cheerful fire in the open grate, the temperature of the room being more steadily increased, and the maximum of heat longer retained by it than with common coal, and although it does not throw out so violent a heat as the best screened coals, yet it has the advantage, if left alone, of continuing to burn till all is consumed to ashes, leaving no cinders; it is entirely free from any unpleasant smell, and when burnt in close vessels it yields nearly the same quantity of coke as the best coals do, and the gas given off burns with great brilliancy."

These favorable opinions, we are happy to be able to say, have been confirmed by subsequent experience. The Commercial Steam-boat Company, in consequence of the beneficial result of some experiments they made, have adopted it for the use of their vessels. One experiment was in work-

ing the engines of the *Prince George* steam-boat from London-bridge to Chatham, Sheerness, and Southend. The same weight of Mr. Geary's coal was taken on board that was usually consumed in a trip to Chatham of common coal, and there was found to be sufficient to work the engines as far as Gravesend on the return voyage. Another trial was in the *Duchess of Kent* steamer. The quantity of common coal usually burnt by this vessel in a voyage to Ramsgate is *five tons*; she performed the voyage with *three tons and a half* of Mr. Geary's Patent Coal. The price paid for the common coal by the Commercial Company was twenty-three shillings per ton. The cost of the patent coal is eighteen shillings per ton. From this there appears an enormous saving in cost, in stowage room and in weight.

There are other advantages besides these which it is important to mention: the captains and engineers of the boats state that there are hardly any ashes left after combustion; no clinkers; only a light white vapoury smoke; and that the labor of stoking is much reduced.

We also understand that coke manufactured from the article has been used with great success on some of the railways, particularly the eastern counties.

An extensive manufactory has been erected for the production of this patent fuel, in the neighborhood of Bow, and another is in preparation at Gravesend. Judging from the foregoing statements, we may venture to predict an extensive demand for this new article of commerce.

PROCEEDINGS OF THE NORTH ANNA AGRICULTURAL ASSOCIATION.

To the Editor of the Farmers' Register.

By a resolution of the North Anna Agricultural Association I have been requested to forward for publication the inclosed communication on the cultivation of the beet and mangold-wurtzel.

I also send the following resolutions of the association on the lamented death of Judge Buel, late editor of the 'Cultivator.'

"Resolved, that the public-spirited, able, and successful exertions of Judge Buel, late editor of the 'Cultivator,' to improve the agriculture of the country, have merited the highest praise, and entitled him to the gratitnde of every friend of agriculture, and that this association deplores his death as a public loss.

Resolved, as a testimonial of the estimation in which we held him, and of our regret for his loss, that these resolutions be transmitted to the 'Cultivator' and the Farmers' Register, for publication."

W. HOLLADAY, *Secretary*.

On beet culture.

Communicated to the North Anna Association for the attainment of knowledge on agricultural subjects.

The cultivation of roots for feeding stock is beginning to attract that attention which it so justly merits; and in furtherance of the objects of our association, I will communicate the result of an experiment which I made the last season in raising the mangold-wurtzel or scarcity root, and the Silesian or sugar beet.

The piece of ground on which the experiment was made consisted of about one and one-third acres of land, which had been ploughed the preceding fall with a two-horse plough, as a preparation for Indian corn. The soil was of good quality, part of it a sandy loam, part clayey. About the 20th of April a light dressing of well rotted manure was scattered over the thinner parts of it; after which it was well ploughed with a two-horse plough; a coulter (also drawn by two horses as deep as it could be forced into the earth) following in each furrow immediately after the plough, so as to break and open the subsoil. An iron-toothed rake drawn by two horses, followed 'till the soil was well pulverized, and in fine tilth. Small lists or ridges were formed at intervals of about two and a half feet, by throwing together two furrows of a one-horse plough, over which a hand rake was drawn, to smooth them and throw off the clods; these lists were opened (with a pointed stick drawn along there by the hand, somewhat like a rake handle reversed) to the depth of about one and a half inches, the seed dropped into them from the hand, at intervals of four to six inches, one seed in a place, and covered shallow with fine earth. The seeds were prepared for planting by steeping them twelve hours in warm water saturated with salt-petre, and then rolling them in plaster-of-Paris. The weather was dry and windy for several weeks after planting, and about half the seed failed to vegetate; they vegetated best where the soil was moist and clayey. As soon as the plants attained sufficient size, they were thinned by hand so as to stand at from eight to twelve inches apart in the drills, those pulled up being transplanted to the vacant spaces; owing to the drought, but few of these lived, and the few that lived did not thrive or grow well. From the planting and transplanting together, about two-thirds of an acre stood, of which rather more than half was sugar-beet, the rest mangold-wurtzel. The crop was worked once with the hand-hoe while the plants were very small, (the weeds and grass being carefully pulled away at the same time by the hand from immediately around the young beets,) and twice afterwards with the single plough (a wing-coulter,) and the hand-hoe. Here, as in the greater part of Virginia, the season was one of unusual drought, corn yielding generally not more than from three-fifths to two-thirds of an average crop; and during the summer I thought my crop of roots would be a total failure; but as the fall approached, it became more seasonable, and then the crop improved rapidly. On the 23rd October, I took them up to seed the land in wheat, and to my surprise harvested more than five hundred bushels of fine roots, besides four or five ox-cart loads of tops, on which my hogs fed kindly. The crop succeeded best where the soil was clayey and moist; and I have found the roots excellent feed for both cattle and hogs. The opinion has been frequently advanced that the climate of Virginia is unsuited to root crops, being too subject to droughts; but my experience of the past season assures me, that to raise the beet and mangold-wurtzel, a fair trial is all that is needed. My roots were worth more than any grain crop I could have raised on the land; and though the relative product of the two kinds cultivated was not accurately ascer-

tained, I think the difference inconsiderable; while the beet is much heavier in proportion to its bulk than the mangold, and probably contains more saccharine matter, it is also more easily preserved through the winter; and on the whole I incline to give it the preference.

A good drill-barrow would have saved me much labor in planting; and if the seed had been steeped longer they would have vegetated better. A friend, on whom I entirely rely, informed me that he steeped a few seed, and kept them moist in a bag covered with earth till they sprouted before planting, and scarcely one of them failed to grow well. If this communication shall encourage others to try the root culture, it will not have been made in vain.

JOHN Y. HOLLADAY.

THE MARL BEDS NEAR NEWBERN.

To the Editor of the Farmers' Register.

Newbern, N. C. Aug. 30th, 1839.

DEAR SIR—Accompanying this letter, I have transmitted to you three specimens of marl, or calcareous matter, found on my farm on Neuse River, about twenty-two miles up the same, from this place. The specimen marked, No. 1, is very abundant, and seems to run in veins through that portion of my field nearest the river. I tapped a vein of it on the side of a hill which terminated very abruptly in a meadow, and pursuing the same, found that it run through a large field at various depths; and in several places it appeared above the soil, in the field. This section of Craven county, bordering on the Neuse River, is inclined to be of a limestone formation, and in many places, both on the banks of the river, and in the interior, there are large masses of the rotten limestone to be found, which as yet have never been applied to any useful purpose. As you ascend the river, its banks disclose different formations of limestone; there are fine specimens in some places of what is termed the shell rock, from which "hand-mill stones" are manufactured, and are extensively used in the country to grind corn into meal, and hominy. There are, also, good specimens of the more solid rock, with now and then very extensive formations of the shell marl, such as the specimen No. 1, and combinations of the oyster shells with other calcareous matter. The other specimens, No. 2 and 3, are found in extensive formations on my farm, but are more or less combined with a hard limestone rock, which make them more difficult of access, and require more labor to dig them from the soil or earth. With all the advantages which the Neuse River presents, of its extensive beds of marl, I believe that not one of our planters have as yet derived any benefit from them, or applied the marl to their lands with any good practical benefit; this has arisen not so much from a want of knowledge of its good effects, but in a great measure from our ignorance in its application, and also from fear that we might rather produce an injury than a good to our lands. There are portions of our lands in the vicinity of these limestone formations, constituting a sort of ridge, running parallel with the river, which are strongly impregnated with lime, as is obvious by the rocks peering above the ground in some places in the fields, and the effect produced by the same, both upon the feet of the laborers and horses. Back of these lands, there are *oak and pine lands*, in which there does not appear to be any lime, nor are any of the effects of it discovered. These lands afford a large supply of both vegetable matter and swamp and marsh mud, which also contains a large quantity of vegetable matter. I will however, reserve a more particular description of the limestone formations of the Neuse, &c., and the character of our lands, for a future letter, and proceed to trespass upon the ready willingness which you have always evinced to afford the desired information, to your many querists. I should be glad to know what per cent. of lime the various specimens of marl which I have sent you will afford, and which you consider best to be applied to such lands as I have described above. I forgot also to mention that the low grounds of the Neuse are overflowed every year, and on the subsidence of the waters, there is left a rich alluvion, which, combined with the leaves which have fallen for successive years, forms an undecayed combination of mud and leaves, that I have thought might be made a very rich manure, with the action of lime upon it. Will a combination of either of the specimens of marl which I have sent you with this undecayed matter, make a valuable manure for our lands? If so, in what way and in what proportions should it be prepared? How would our swamp mud mixed with either of the specimens of marl answer for manure, and what would be its probable effects on our lands the first year, and how should that be prepared? Can we convert our extensive beds of rotten limestone to any good practical agricultural purposes? In fine, I do not consider that there is any merit in saying to you that I have no practical knowledge in relation to the use and application of marl, and that I am a novice and sciolist in agricultural matters, and as "misery is said to love company," I find that my neighbors are all in the same predicament, and that I can derive no information from them on the subject—this must be my apology for trespassing on your valuable time, and likewise for seeking answers to queries which I have no doubt you will deem very trite and common, and rather *schoolboyish*, for a farmer. Would the application of either of the specimens of marl sent, to such lands as I have described, unaided by any other matter, be productive of much benefit? As a large district of country is interested in obtaining information in relation to the marl I send you, your views in general in relation to it, would be very acceptable indeed.

Very respectfully yours,
JAMES W. BRYAN.

The three specimens of marl which accompanied the above letter, have been carefully analyzed, so far as it regarded their calcareous ingredient, or proportion of carbonate of lime.

No. 1, consisting principally of loose small shells, and fragments of shells, yielding 66 per cent. of carbonate of lime.

No. 2, apparently of firm texture, or hard marl —62 per cent.

No. 3, still harder—75 per cent.

As the best mode of answering the other in-

quiries of our correspondent, we have sent him the 'Essay on Calcareous Manures.'—Ed. F. R.

For the Farmers' Register.

THE CASE STATED, AS TO THE FITNESS OF THIS COUNTRY FOR SILK CULTURE. FRAGMENT OF A DIALOGUE.

Con. "It is absurd to expect to produce silk in the United States to profit. I am not speaking of the raising a few worms by some otherwise idle female of the family, nor the reeling and twisting the product into sewing silk, for home use, or at most to supply the tailors and sempstresses of the neighborhood. Such employment I say nothing against. It may serve as amusement; and, comparatively, may even yield some profit, as any species of productive industry is better than absolute idleness. But as to competing with the French, Italians, and Chinese silk-growers, in the markets of the world, it is too ridiculous for serious consideration. The weight and bulk of silk are so small compared to its value, that its transportation to the remotest parts of the world would scarcely add one per cent. to its cost. So that distance from market is of no account. Putting aside foreign markets, where our silk producers would have to meet others on more equal ground, in our own markets they would have to compete with foreign growers, whose hired labor, and products of labor, had cost them but the tenth or twentieth of the ordinary price of labor in this country. A peasant in Languedoc, or Lombardy, will labor day after day for the daily wages of ten cents, and may even lay up half of that, as in general bread alone is his cheap food. But even that labor is high compared to the rate in China. There, a a cent or two will pay for the day's labor of a woman, if not of a man. Nay, a handful of rice will sometimes be thankfully received by the starving laborer for the unceasing toil of a whole day. And it is against such odds as these that this country is to contend in the silk markets of the world! Before this can be done successfully, you must persuade the industrious and well-fed laborers of the northern states to be content with the small wages and the meagre fare of the Italian, and the lazy laborer of the south, whether white or black, to toil and to starve with the Chinese."

Pro. "I admit, that in regard to the cheapness of labor compared to Europe, and still more to China, we shall be at disadvantage, though not to the extent you claim. Your comparison of labor might be correct, if able-bodied men in this country were the laborers required for silk-culture. But dear as their labor certainly is, the wages of females are generally very low—and the infirm, the very old, and the very young, (all however useful for feeding worms,) work not at all, and of course earn nothing at employments now existing. A vast amount of cheap labor can be obtained from these sources. But in Virginia, where *you* suppose our principal labor, that of slaves, to be the dearest in the world, we have, in fact, labor suitable for silk-culture that is even cheaper than in China. There are but few landholders who have not some slaves, who do no work, and who are maintained at precisely as much cost as those who do labor. All the labor that these idlers could give to silk-culture would absoutely *cost nothing*; and therefore, it is certain that no hired labor elsewhere can be cheaper. These new workers (but old eaters and consumers,) are the aged slaves of both sexes, females nursing infants, and boys and girls too small for field labor. And besides this kind of labor, which costs nothing, that of many others could be added, both bond and free, whose present employments yield so little, that even half wages at silk-culture would be a gainful change.

"But though *labor* is certainly an important element of the cost of silk, it is not the only one that deserves to be counted. There are three important elements of the cost of raw or reeled silk. The first, and the most important in Europe, and the *all*-important in China, is the *land* necessary for the buildings, and the growth of the mulberry trees. In Lombardy, the best silk country in Europe, the mere annual rent is usually far greater than the fee-simple of the land equally productive can be purchased for in Virginia; or the greater cost of land there may be safely estimated at 20 times as much as ours. In China, the value of land is very far greater than anywhere in Europe; and of course, so much the greater there is that element of cost. So dear is land in China that it is there economical to substitute the labor of men for beasts of burden or draught. The plough is but little used in their very perfect tillage, and the streets of their great cities and villages are generally so narrow as not to permit the use of wheel carriages. Immense numbers of families dwell permanently in boats on the rivers, because they cannot pay the rent of a dwelling spot on land; and they even cultivate vegetables on rafts of bamboo covered with earth. Conceive then the enormous expense of landed capital required to devote even a few acres of a farm to the growth of mulberry trees! A third element of cost is the construction of the cocoonery and other necessary buildings and fixtures. I am not enough acquainted with European prices to compare with them on this head. But there is no doubt but that this part of the expense, (being principally of timber and coarse materials,) is also cheaper in this country.

"Thus, then, while one of the three elements of the whole expense of silk-culture would *generally* be the most costly here, the other two would be cheaper, and the most important of them greatly cheaper. And so much the most important of the three elements is the *land*, that, taking all together, there can be little doubt but that all the elements of cost combined, will be less in Virginia than in France, Italy, or even in China. The superiority of a country in one of these respects amounts to nothing, if it be counterbalanced by as much inferiority in the others. It is the *balance of combined advantages*, in all the three elements of cost, that must show which country is best adapted for silk-culture; and that balance I am confident we possess.

"Besides—the amount of out-door labor necessary, and of time for preparation, are now reduced to one-fourth of what was before required, by the introduction of the new many-stalked mulberry. It is true that the old silk-countries will also avail of this benefit; but every general and equal diminution of labor (which is *our* heaviest expense) serves to lessen relatively our only disadvantage.

"Again—expenses are incurred in proportion to

the numbers of worms to be fed, and not according to the final or usual success of the rearing. If half the worms die in their last feeding age, from the effects of bad climate, (as is more usual than otherwise in France,) the cost of food is but little lessened, and the trouble and perplexity of the culturist fully as much increased by his loss of half his stock, and of course half the full product. In our far superior climate, as in China, such losses will very rarely occur; and therefore, even if the whole cost of feeding a certain number of worms *were* equal, the product obtained would be greater in this country than in France, where the average mortality and loss of worms is so much greater. And the quality of the product, (as is already a well established fact,) will be superior, as well as the quantity.

"A dry atmosphere, the security of mulberry leaves from late frosts—in short, a good silk climate—though not an element of *cost*, is eminently an element of *success* in rearing silk-worms. We possess such a climate, in common with the Chinese and the Turks of Asia Minor; and such as is not enjoyed in any part of western Europe. It is the possession of this great advantage, still more than cheap labor, that enables the Chinese to make the cheapest silk on the dearest land and food in the world; and the indolent and negligent Turk of Asia Minor to compete with the intelligent and industrious European."

ON SEA-WEED.

From the Cultivator.

Wheat-Sheaf Farm, Staten Island, September 16th, 1839.

J. Buel, Esq.—*Dear Sir*—In your last number, you expressed a wish "to receive a communication from some person familiar with the subject, as to the best mode of preparing sea-weed, and of applying it to the soil." I will not say that I am myself as familiar, as I may become on further experience, with the *best* mode; though I have read much of it, and, as attentively as I could, have noticed the practical coincidence of what I have read with the result of my own, and the usual neighboring modes of using it; and I believe I have read essentially all that can be found published, as the result of practice or science, in relation to it.

On turning to page 135 of your same number, among the very excellent observations of Henry R. Madden, Esq., of Edinburgh, we find much of what may be said of it. The sea-weeds of the coasts of Scotland and Ireland are, no doubt, in most respects, similar to ours. Those of our coast, as well as theirs, fall within the general botanical descriptions of *Algæ*, *Fuci*, and *Confervæ*. The similitudes may be traced distinctly in Loudon, where the forms of the entire plants are given.

Though beneficial to a sandy soil of good composition, they have been found, I believe, mostly so to a clay, and well calculated to divide its tenacious or adhesive qualities. They are here usually ploughed in with ordinary manures, after they have become dry and short, through the limited fermentation spontaneously occurring in the sea-weed heap; or after they have been taken thence, more or less dried, used as barn-yard or way litter, and thus become incorporated with the manure. On such applications, a free use of the sand of the sea-shore is also made, intermixed with it, if intended for a clay soil, for several reasons—on account of its saline humidity, and the known attraction for moisture of stony or silicious substances once wet with salt water; of the superior influence of sea-sand (in which of course no clay is to be found) above ordinary sand, in amending the composition of a clay soil; on account of the frequent admixture with beach sand, of the granulations or particles of minute sea-shells, which the frictional action of the sea on its stones break up, and intermixes with it; and also of the operation of the sand on the vegetable substances brought into contact with it by the tread of cattle, and which the acute angles of the sandy pebbles cut and divide, thus accelerating the division of the vegetable matter, and hastening its preparation as a manure.

Sea-weed is also in some instances wind-dried, with little or no fermentation, and thus used for littering horses and cattle, thence finding its way to the manure heap. This practice is well enough *with such surplus* as may be gathered over and above all the farming supply that can be *ploughed in green*, which has ever been considered, *elsewhere than here*, the best course with every description, except that particular species of the *Fuci* class known as the *zostera marina* (wrack grass,) a long (say two or three feet) flat leaf or spear, a sixteenth of an inch wide, which, in the heap, hangs together in large masses. This is more difficult to decay than the rest; but when short, answers a very useful object, over and above its saline and vegetable properties as an amendator of the texture of clays, in which its detached short pieces will remain visible for many years, dividing its particles. This weed could be readily and expeditiously broken or cut fine by a horse-power operation and machine, similar to the teeth and concave and convex of the common thrasher; and then that too would be best ploughed in green. Its length entire would render the operation of ploughing it in, if at all possible, extremely difficult, and then it would remain undivided by decay too long for free tillage.

Although I, for my own part, entirely disagree with the practice, so often urged, of applying lime, *out of the earth*, to vegetable manures *which have been cured*, or in any way deprived of their succulence or mucilage, or animal manures or substances in any shape, I would use it freely with all kinds of the sea-weed *while green;* because the lime in that contact will become effectually divested of all its causticity, be thus readily fitted for immediate action on vegetable growth and the soil, and will by its heat overcome the check to fermentation which the saline impregnation of the weed gives to them. If the heap in this state be occasionally wet, it will aid the operation by preventing the excessive heat which the lime would engender.

Lime, as I understand it, not only betters the texture of a clay soil, but its causticity particularly is *destructive of any acidity in it;* and so are the saline parts of the sea-weed, as I believe, and propose explaining presently. Perhaps before the causticity of the lime is exhausted by a contact with green vegetable fermentation, or with the

soil, but assuredly after, its greatest use is as a stimulant or solvent of the vegetable or animal manures within the soil, and for whatever of pabulum may be requisite to the fibre or rigidity of the plant in sustaining itself against the influence of the winds while attaining its maturity. We have a familiar exemplification of the action of lime on dried vegetable substances, on boards and pickets. The minute splinters left in boards by the teeth of the saw, if soggy or prone to rotting, *whitewashed*, become hard and indurated, and seem checked in their progress to decay by the lime, and the wood is perfectly solid. The same result will be visible if it be applied while yet caustic to dried hay or straw. When lime is brought immediately in contact with animal substances, as with oils, it corrodes and solidifies them; with animal juices, it assails and operates similarly on them, leaving nothing but the mere aqueous fluid; with animal flesh, it checks its putrefactive progress, and as it were petrifies it; with effluvia, it absorbs it. The chemists say, probably with truth, what the lime takes up, or renders *insoluble*, in time it will give back again. This, though true as to a *part* of the substance imbibed, may or *may not* be as to *much of it;* but if even so, it should be recollected that the object of applying manure is to benefit the first, as well as the future crops; and the first is dependent entirely, whatever may be the supply put into the soil, upon that portion of the manure which is immediately soluble; and if that be held in suspense by the lime, the first crop at least will suffer. This not unfrequently happens with the farmer as to his manure. For the want of an admixture of a portion which is readily soluble, his crops come up ahead of the manure, and leave him to suppose it not so effectual as he had anticipated; an argument, by the by, for blending manure with the soil before its moisture is assailed and evaporated by the drying influence of the sun, and for that humectation which could be given to it from a reservoir in or about the barn-yard for the liquids, and an admixture of it at the moment of taking it out for use. But I am digressing. To return: as to sea-weeds--

I would then *first*, use them green, as far as my farming wants might require or permit.

Next, if the supply be sufficiently extensive, (with me it probably is 800 two-ox cart loads annually,) I would use it liberally as litter in every and any shape about my stables, cattle stalls, hog pens, barn-yards and muck roads; and that too in opposition to common practice, as far as practicable, while green; because, it will be perceived by those who use it, that as (with the wrack grass more visibly) the weeds dry, a white efflorescence of salt gathers upon the surface, which rains wash away, and this salt is one of its most valuable properties. If, while passing from its green state, its succulent, mucilaginous and saline properties escape into the materials for manuring, which environ it, the vegetable remains of the weed, divested of its natural juices, will, in escaping, serve as an absorbent of other useful liquids brought in contact with it.

A *third*, and very beneficial mode of using sea-weed, is by incineration. Reduced to ashes, its properties become concentrated, and it is both powerful as a manure and useful commercially. The carbonate of soda of commerce is obtained by lixiviating the ashes of sea-weed. The best variety is known by the name of *barilla;* an inferior kind, known by the name of *kelp*, is prepared from sea-weeds on the northern shores of Scotland, and may be so any where it is to be found. The purest barilla always contains potassa and soda, and the chlorides of potassium and sodium; each of which, though perhaps most profitably employed in the manufacture of soap and glass, would if applied as a manure to the soil, operate powerfully, and at the same time, from its strong alkaline influence, serve as a solvent to other manuring substances in the soil.

I believe the sea-weed, though best in this point of view if ploughed in green, even in its dry state, a corrective of the acidity of a soil. On a field, the soil of which was probably the poorest of my farm, and in which I was preparing to put rye, my carts had deposited some green sea-weed in heaps, with the intention of spreading it before ploughing. A want of time prevented the execution of this purpose in the way proposed, and it was thinned with a fork around the small heaps as it lay, after it had become dry, and ploughed in with the manure for the field. As the crop grew, the grain rose in its growth most visibly within the circumference of the sea-weed thus spread around the heaps, and so much so as to be remarked by all about the farm, and to leave no doubt of its influence. The next year, as the grass came in succeeding the rye, some sorrel was seen generally over the field, but none was visible within the circumference of the sea-weed; and the grass, in comparison with the rest of the field, was visibly improved, and yet continues so. The sea-weed used on this occasion was of the species familiarly known by the name of *chowder;* a very thin leaf, very aqueous, and prone to rapid decay.

The principal kinds in use as a manuring material on my shore, and generally in this vicinity, are the *zostera marina* above alluded to, (sometimes called, here and in England, wrack grass;) the chowder also before named, and rock weed. There is also occasionally intermixed a dark brown, broad, long and gelatinous leaf, the name of which I do not know.

Sea-weed, particularly the latter and rock weed, are eaten with avidity by swine; and where continual access is had by them to it, will promote their growth and fatten them, though the flesh is far from palatable, if they are not fatted, for two or three months before killing, exclusively on other food better fitted for putting good flesh on them. Some farmers give them little else, up to within that period of fatting time. When thus permitted, however, to range for food on the sea-shore, they feed exclusively on muscles and such shell-fish as they can crush with their teeth, are fond of fish generally, and particularly so of the description known as *horsefeet*.

The wrack-grass sea-weed may also be used as a thatch, and forms a more durable defence against the violent winds and heavy rains than straw.

The latter also is used as a substitute for horse-hair in stuffing mattresses and furniture. For this purpose, it is carefully washed twice in fresh water, and then dried quickly, the intermixture of other sea grasses less fitted for the purpose being picked out.

It is very convenient and effectual for sheltering a manure heap from the drenching of rains, and protecting it from solar heat; for covering plants

in gardens, vegetables left in garden grounds, or buried for winter keeping; or for young trees, to protect them from the rigorous frosts of the wintry season, and for a variety of purposes about farming buildings.

An opinion of the practical estimate of its utility may be formed from the fact, that for manuring purposes, it is carted in Ireland to the distance of forty-five miles inland from the sea-coast.

Ezra L'Hommedieu, Esq. formerly senator from Suffolk, a very intelligent and skilful agriculturist of his day, in a communication made to the Agricultural Society of this State in 1791, says, "many farmers are of opinion that one load of sea-weed as a manure, is equal to a load of cow-yard manure, for raising wheat." And he says, "that within the two years then preceding, he had used more than 200 loads for wheat only, but he did not find it equal by five loads in thirty; that it was found in some respects superior to any other kind for Indian corn, as it prevents worms and injury from drought; that the preceding summer, much Indian corn had been cut off by that means, but where the lands were manured by this weed, the corn was not affected."

It may not be amiss here, while quoting from this writer, whose authority is too well remembered to permit a question as to the authenticity of his statements, to notice what he says of the manure of mud taken from salt water creeks and swamps, and in which the weed often grows:—

"Mud from the creeks on Long Island and on the sea-coast of some parts of Connecticut, has been made use of as a manure, with success in some instances, when in others no benefit was experienced. This is owing to their using two kinds of mud. In order to determine which is fit for manure, if you run a paddle or a pole into the mud, and it sticks so fast that it is with some difficulty you pull it out, you may determine that mud unfit for manure, it being only loam or clay soaked with water; but if your paddle or pole is drawn out easily, the mud is fit for manure. This mud being taken out in the summer and exposed to the frost during winter, in the spring, becomes as fine as leached ashes, and is a good manure especially for grass; being spread on poor loamy land, it brings up white clover similar to ashes, though it takes a larger quantity."

To return particularly to sea-weed, and to direct attention to facts, which here have been little if at all noticed. There are many of the *Fuci* class of sea-weed which elsewhere are, and here may become edible. They are used as condiments by families living near the sea-coast in other countries, and by the poor, because in seasons of scarcity they furnish articles of resource as a food.

There are numerous species employed in gardening as manures.

The *laminaria saccharina* (sweet fucus or sea-beet) is sometimes boiled by the common people of England as a pot herb. The Icelanders, Audubon says, boil it in milk to the consistence of pottage, and eat it with a spoon. They are also said to soak it in fresh water, dry it in the sun, and then lay it up in wooden vessels. It soon becomes covered with a white efflorescence of salt, which has a sweetish taste, and in this state they eat it with butter. They also feed their cattle with this species.

The great value of the Iceland and of the Carrigan moss or *lichen*, in consumptive or pulmonary complaints, is well known every where.

The transparent edible nests of the East-India swallow, so much in repute at the luxurious tables of the rich in China and the East, are now generally believed to be almost entirely composed of gelatinous fuci, and more especially of the lichenoides. The plant also is in high estimation for the table in India.

Of the *halymenia palmata* (L. dulse,) both the tender stalks and young fronds are eaten fresh from the sea, commonly without any preparation. They are sometimes considered as forming a salad, but more generally are used as a whet. It is said that the inhabitants of the Greek Islands are fond of this species, adding it to regouts and olios, to which it communicates a red color, and at the same time imparts some of its rich and gelatinous qualities. The dried leaves infused in water exhale an odor somewhat resembling that of sweet violets, and they communicate that flavor to vegetables with which they are mixed. Lightfoot mentions that in the Isle of Skye in Scotland, it is sometimes used in fevers to promote perspiration, being boiled in water with a little butter. It is soft and limber, and does not become rigid in drying, being of a more loose texture than many other sea-weeds.

The *halymenia edulis* (red dulse) is by many preferred to the *h. palmata*, especially for cooking in the frying pan. Like that species, its smell somewhat resembles sweet violets.

Laminaria esculenta (badderlocks or henware). The midrib, stripped of its membrane, is the part chiefly eaten. In Orkney, the pinnæ are also eaten under the name of *pickles*.

Sphærococcus ciliatus (ciliated dulse,) and *laminaria digitata* (fingered dulse, sea girdle and hangers,) are sometimes gathered and eaten, like the *halymenia edulis*, *palmata*, and other species.

Laminaria digitata. In Scotland, the stem of this species is used for making handles to pruning knives. A pretty thick stem is selected, and cut into pieces about four inches long. Into these, while fresh, the blades are stuck; and as the stem dries, it contracts and hardens, closely and firmly embracing the hilt of the blade. When these handles have become hard and shrivelled, and have been tipped with metal, they are hardly to be distinguished from hart's horn.

Chondria pinnatifida (pepper dulse,) in Scotland, is eaten along with the *Halymenia palmata*; and in Iceland, it is used instead of spice. This species is common to Scotland, Iceland, the Red Sea, and the shores of Egypt.

Floating fucus. The succulent fronds, Turner mentions, are selected and pickled like samphire; and the young shoots are eaten as a salad, seasoned with juice of lemons, pepper and vinegar.

Ulva lactuca (lettuce leaves or oyster green). The thin green pellucid membranes, of which this vegetable is composed, are eaten raw as a salad, and esteemed a great delicacy by such as are accustomed to the use of marine vegetables.

Thus, sir, in answer to your wishes, I have given you what I know, or have read of sea-weeds, and their various uses and applications. It may serve to show us that the vegetable kingdom of the ocean, if not as extensive as that of the dry land, has at least its treasures, not only to fertilize the earth, to minister to the weak and the

infirm, to feed the poor and the needy, but even to gratify and to satiate the ever-craving and the pampered appetites of the sensualist; that as yet we have not learned fully or perhaps fairly to appreciate them, or this among the many bounties of an ever-good and an all-wise Providence.

Yours truly,

W. A. SEELY.

From the Journal of Commerce.

MILK.

[*From a correspondent in Europe*]

It is gratifying to see, from the columns of your paper, that deep interest has been awakened in regard to the quality of milk used in the city. It would seem as if no parent who reflects that the bones and muscles and constitutions of his children are composed from this very milk, could hesitate to incur any expense, to make any efforts which his circumstances permit, to ensure a supply of the very *best* material for his purpose. Even the most rigid economy requires it whether we think of the expense of a feeble family, or of the continued demands which they often make upon parents, even after they are sent forth into the world. I cannot but hope that this feeling will even aid in the promotion of the northern rail-roads, from which it is most truly observed the most effectual relief can be afforded. It may be said, indeed, that pure milk can be procured from the farms which abound in every direction from New York. But let it be remembered it must be transported for several hours in conveyances which would serve admirably for *locomotive churns*—which cannot fail to prepare the milk to become speedily sour, whatever may be its original quality, unless indeed it may have been previously diluted and whitened with lime water.—On a rail-road, it may be brought six times the distance in the same period, and almost without perceptible motion; to say nothing of the greater security of good food in places where grass is cheaper than slops, or even the mixture of decayed vegetables and parings and remnants of salad, &c. which form the refuse of the kitchen, and which are so often procured as a dainty morsel for the cow, to be returned afterwards in the form of pure milk!

I have recently met with a report addressed to the Medical Society of Paris, on the subject of milk, which shows the importance of procuring this food of children from the purest source, in a new light; and proves that "distillery slops" are not the only thing injurious to its quality. Messrs. Petit and D'Arcet, distinguished chemists in Paris, were led to examine minutely the quality of different specimens of milk, from observing their very different effects upon children. Some that they examined, and which they found to be speedily thrown up by the children in coagulated masses, was proved by chemical tests to have a predominance of acidity, though it was not perceptible to the taste. Other portions which were well digested, were proved to have a predominance of alkali, which is considered the natural condition of milk. On inquiry, it was found that the cows from which the first milk was obtained, were *fed in the stable*, with remnants of vegetables as well as hay, and almost without movement—that the alkaline and healthy milk was from cows allowed to *range and feed in the meadows*.

These observations led them to examine the varying qualities of milk on a more extensive scale, as to the simple fact of the predominance of acid or alkali, and for this purpose they availed themselves of a test which may be procured without difficulty from a chemist. It is paper dipped in a solution of *litmus*. If it be of good quality, the blue color will be changed to red by a fluid which is acid. A tincture of the blue cabbage will detect acidity also, if it is sufficiently fresh, in the same way.

During a voyage through Flanders, M. D'Arcet in company with the celebrated chemist Gay Lussac, visited some of the best dairies, in which the cows are fed upon the meadows, and found the milk *without exception*, to contain a predominance of alkali. They examined the milk of cows fed in the stall on turnips, the leaves of vegetables, &c. which were only allowed to pass two hours a day in the meadows, and found it as uniformly acid.

The same experiment was repeated in the grazing regions in the north of France, and uniformly with the same results.

It would seem then to be fully ascertained, that pure and perfect milk can only be given by cows that pass the greater part of the day in the meadows during the mild season, and that it cannot be furnished by cows which are fed upon the parings and tops of vegetables or other food than the grasses, and are deprived of exercise—to say nothing of the pernicious effects of the distillery slops or the sour and putrid remnants of the kitchen. And yet this milk must be the staff of life of childhood—the staff of which its bones and sinews are formed; and its quality will do much in determining the feebleness or vigor of the next generation in your city. It is too true that the impure and often infected air, and the limited exercise of children in a city—added to the incessant and intense excitement of its movement and bustle—while they often render childhood precocious, and youth premature, lead to decay equally premature in a generation taken together. But surely this is an additional reason for seeking the purest and best possible nourishment in order to counteract these inevitable causes of decline.

I am sure that many a mother will thank me for adding that these chemists, on observing variations equally great in the digestion of children fed by different nurses, found the same difference in the quality of their milk—and that which was thrown up frequently coagulated, was uniformly sour when it was received—not to the taste always—but as tested by litmus paper. They observe that the child is not only deprived in this manner of suitable food, but he is obliged to call for it 40 or 50 times a day, in place of 4 or 5 times, and thus fatigues and injures her own stomach, without being nourished, and wearies and exhausts his nurse so as to render the quality of the milk still worse.—Such a state of things, they say, ought immediately to be remedied, and that it can often be done by giving the mother or nurse a more simple diet, or by means of medicine, which a judicious physician can prescribe, among which they consider minute doses of super-carbonate of soda the best.

But can nothing be done to paliate the evil until we can procure pure milk? M. D'Arcet made the experiment in his own family of adding one half a grain of super-carbonate of soda to a pint of milk from a city fed cow, and succeeded in rendering it harmless at least, and far more nutritious.—

One of his children, so feeble that he despaired of being able to save him, was thus suitably nourished, and grew up to vigorous health, by observing daily the quality of the mother's and finally of the cow's milk, and taking the proper measures to correct its defects. Now it will be incomparably better to procure the pure milk of the grass fed cows on the banks of the Hudson and on the hills of Connecticut, than thus to feed the poor children with a drugged mixture; but it will be at least a temporary palliative until the northern rail-road can be completed, and pure milk can be obtained as easily as the pure water of the Croton river.

Housekeepers will be glad to know that by adding the same proportion (one half a grain only to a pint of milk,) good milk may be kept 24 or 36 hours, without danger of souring, even in warm weather. But let them beware of converting food into medicine by increasing the quantity, for I have known this "simple, *harmless* thing," as it is called, even in the shape of excessive dratis of soda water, produce sores in the mouth and lips, which indicates corresponding sores in the stomach and this was followed by the miseries of dyspepsia and decline. An able physician assures me that he could ascribe the death of a patient, from a similar state of mouth and stomach, to nothing but the famed morning cordial of Connecticut lay physicians, "*pearlash and cider.*" It is time the world had learned that medicine cannot safely be used as daily food or drink, without leading to disease.

Yours, &c. S.

GRANT THORBURN IN DEFENCE OF HIMSELF AND HIS CHINESE TREE-CORN.

We had designed our remarks in the September No. (page 573) as the last notice of this subject. But as Mr. Thorburn has written in reply, and defence, and asks that his letter may be laid before the readers of this journal, rather than permit the least ground for charge of denying justice, or of being wanting in liberality to any one whom we have assailed, we will again permit a page to be occupied with this subject. We shall give Mr. Thorburn's reply in full; and then our own comments, and *last* notice of him or his subject.

To the Editor of the Farmers' Register.

Astoria, L. T., 6th Nov., 1839.

SIR—I send you a box of the Chinese tree-corn, and two stalks having the ears on them as they grew; I think you will find that at least it is a new variety. Also about 30 ears of the corn to distribute among your friends; and I hope if you live to see the 10th of August next. you will be satisfied that I wrote nothing about this corn but the plain truth. This corn, Mr. Editor, is really a valuable article; it is a pity it should be strangled in its birth. I ask nothing for it or for myself, but a fair trial. When I commenced selling seed, 30 years ago, it was with a stock of only fifteen dollars; now, there is not a town, village, or hamlet on the continent but you will find, "*Thorburn's seeds sold here.*" It is but a fair inference then, that the seeds must have been good, else the business would not have grown so fast. Now, Mr. Editor, after having spent thirty of the best years of my life with the approbation of the public, you may think it is not a very pleasant reflection to have so many hard names (without a cause) thrown in my face; notwithstanding all that has been said both for, and against it, I am convinced from two years experience, that it is the most profitable corn for the farmer of any in the country (the *Baden* excepted, but this rarely ripens with us); most of my correspondents who have been successful in its cultivation this year, say, they will never plant any other sort. The demand for the Chinese corn continues, it is sold at my son's stores for twelve and a half cents per year. I think I have given away thousands, but never sold an ear except to my son.

George I. Pumpelly, Owego, Tioga co., N. Y., 10th October, 1839, writes, "my crop of Chinese corn is the finest I ever saw of any corn, 100 bushels to the acre," &c.

The proprietor of the 'Painsville [Ohio] Telegraph,' says, "I cultivated a small patch of Grant Thorburn's Chinese corn; average yield, four large, sound, ripe ears, for every kernel planted."

R. H. Keywood, writes to the editor of the 'Buffalo Commercial,' 22nd October, "I send you an ear of the Chinese corn raised on my farm in Ohio, which proves to be [others to the contrary] all that was recommended by Mr. Thorburn," &c.

T. M. W. of Cleveland, Ohio, 25th October, writes, "about the middle of August my whole crop of Chinese corn was ripe and gathered; it was previously examined by the officers of the County Agricultural Society, they gave it as their judgment, that it would yield, at least one hundred and twenty bushels to the acre of shelled corn; but as I left home before it was shelled, I cannot speak to a certainty." N. West, Indianapolis, Indiana, planted his Chinese corn 8th of May, was all ripe and gathered 29th August, proved to be true as represented by G. Thorburn, &c. &c. Mr. Coomlis, Freehold, New Jersey, is of the opinion, it will produce one-third more than any corn raised in his neighborhood, &c. Mr. Hendrickson of the same place, writes in the same strain of commendation. Mr. Prentiss of the same place, planted from the 16th to the 21st May the Chinese corn, was ready for husking on 1st September. Mr. R. S. D. Jones, Friendship, Md., planted a few grains in his garden after his other corn was up; and the tree-corn was fit for use the earliest, &c. I might fill a small volume with similar extracts, but enough I think has been said to induce those who have failed in the first to give it a second trial. Now, Mr. Editor, as there are two sides to this, like every other question, I think I have a claim on your impartiality to be heard in my own defence, in your widely circulating paper. Yours sincerely,

GRANT THORBURN.

The corn has been received, and will be given away to any of our subscribers who have not already had enough of this famous seed. If not so disposed of, it will be boiled in the wash for our town milch cow, as a partial indemnification for the payment of freight and cartage. As to the quality, the separate ears are of good size, (for a northern flint or hard grained corn,) just as might

be *picked* of the best, from any crop, of any kind. The ears on the stalks, (three on each,) are very inferior. These *do* grow on the ends of long stems—(though such we know is not the *general* character of the growth—) and so much the worse for it; as every farmer would prefer that his ears of corn should grow on short stems, firmly attached to the stalk, rather than on long ones like these. A similar mode of growth (on long stems) may be often seen on particular stalks of other kinds than this; but the peculiarity would be one to avoid in the selection of seed, rather than to be sought for or prized as an advantage.

It is amusing to observe how cunningly the writer has made his reply to our strictures to serve as an actual though disguised *advertisement* for the sale of his corn, accompanied by recommendary puffs, like quack medicines, in the most approved form—and at the same time letting the public know that the sale is to be continued for another year, at the reduced price of 12½ cents the ear. No doubt to effect this object, and at so cheap a rate, was the main purpose of the above *reply*.

But even if every particular attempted to be made out in the above letter, were fully admitted—and supposing (what we have no right or wish to deny,) that each of the *certifyers* wrote in perfect good faith—what would it all amount to? No more than this—that out of the thousands of persons who bought the seed, and planted and cultivated it on the richest ground, and with the greatest possible care, that these few persons (and possibly hundreds of others also) made a very large increase from the seed and for the space planted. Could it have been otherwise, under like circumstances among several thousands of such plantings, with any other kind of corn, whether a good or a bad kind in general? All the numerous varieties of Indian corn (other than by cross-fecundation,) have been produced by the effort of nature to accommodate the growth to the different circumstances of soil, climate, &c., and therefore it is probable that there is no one variety, however unproductive in general, that may not be the most productive in some peculiar circumstances. Therefore, if out of several thousand persons who have in the most careful manner cultivated Mr. Thorburn's high-priced seed no more than a dozen or two have found it a *superior product* (or have guessed so, without any accurate experiment of comparative product of another kind,) it is rather to be wondered at that such results (or supposed results) have been so few, than so many as are presented.

But, if in fact it were fully proved, instead of the proof being altogether deficient, that this corn is a more productive and valuable kind than the kinds long known and usually planted, its recommendation and sale would be not the less subject to the charge of designed deception, and an imposition executed on the buyers and the public. The *true issue* is not *whether this corn is a good kind, or not*, but 1st, whether Mr. Thorburn, when he first recommended and offered it for sale, *knew* it to be such—and 2nd, whether its sale was not urged by false pretences. In our first denunciation of this humbug, (page 490, vol. vi.) when republishing Thorburn's original advertisement and statement, we took the same ground which we still maintain. When exposing all the other pretences there made, we expressly declined saying any thing against the productive value of the corn. Our words then were these: "Of the corn itself, it *may* or *may not* be a good kind. It would be as presumptuous in us, upon this [Thorburn's] statement, to pronounce it of no greater value than the ordinary kinds, *as it is in Mr. Thorburn to assume so much value for it, upon his few facts, and very slight experience of its growth.* We merely *believe* that it is of no superior value to other kinds, (except like spring wheat, as a humbug,) but do not pretend to *know* it." If then, by possibility, this should prove to be, (what not the least proof has been presented *now*, and much less a year ago,) a truly valuable and productive kind, it would be an accidental result, which Thorburn had no ground to anticipate last year, nor to promise—and which his now *two years* experience would still be insufficient to establish, even if his own declarations are to be taken as proper evidence of the facts. We therefore will not permit Mr. Thorburn to make up a new issue, upon which to try his claim to truth and integrity. The question is not, and never has been, whether a particular parcel (or different parcels) or variety of corn was a good kind to cultivate; but the following several other points were the matters in question, viz:

1. Whether the *foreign origin* of the corn was truly stated?

2. Supposing the origin to be truly stated, whether G. Thorburn knew, or had any sufficient ground for belief, that the corn he so highly recommended, and sold so high, deserved his commendation, or indeed was worth any preference?

3. Whether the giving the whole net proceeds of the sales in charity has not been even more of a deception than we anticipated and stated at first.

Now in his reply, Mr. T. merely again offers his own assertion, and the favorable opinion of a few individuals as to the matter *not at issue*, and not disputed (though certainly not believed) by us, and says not a word as to the matters which were really in dispute—but which his silence will now leave no longer questionable. He has not adduced the testimony of the merchant in New York who, as he stated, found the original seeds in a

box of tea—nor has he answered a word as to the promised appropriation of all his gains to charitable purposes. His reply is nothing more nor less than a new mode of advertising his commodity. In this art, (or rather science, as it may be considered at this day,) Mr. Thorburn has certainly evinced the possession of as much and rare talent, as of boldness in its exercise. Sheridan might have gathered additional lights from Thorburn's account of his tree-corn; and would have doubtless added to his satirical classification of puffs in 'The Critic,' the "puff charitable," as the most efficient of all in the list.

JUDGE BUEL.

From the Genesee Farmer.

The wide spread feeling of sympathy and regret, experienced by the public at the unexpected death of Judge Buel, whose decease at Danbury, in Connecticut, has been already noticed in this paper, is fully shown by the numerous respectful notices which have appeared in many of the journals of the day. In somewhat delaying the remarks which the loss of our respected friend and cotemporary seemed to render proper, we have been influenced by the hope of making our notice more full and complete than a more hasty one could have been. We shall, however, be able only to give a general outline of his course, a sketch which will, we hope, be hereafter filled up for the benefit of that public he so long and efficiently labored to serve.

Like Franklin, Judge Buel commenced his career in a printing office, and perhaps a still farther similarity may be traced in the eminently practical turn of his mind, which, allowing but little to mere theory, conceded all to practical utility. He first, we believe, edited and published a Republican paper at Poughkeepsie in Dutchess county; which was followed by another issued at Kingston in Ulster. From Kingston he removed to Albany, where for a number of years he edited and published the state paper, (the Albany Argus,) with ability and success. Judge Buel was a Democratic Republican of the Jefferson school, a plain and forcible writer, and one that treated his opponents with courtesy and amenity. In his office of state printer, he succeeded in saving a handsome property, which he invested in a farm, and to which he retired when he disposed of his interest in the Argus. Judge Buel had not taken an active part in politics for some years, though he was selected as the opposition candidate to Gov. Marcy in 1836.

It is as a skilful and practical farmer; an efficient and undeviating advocate of agriculture, of its legislative aid and protection, and its advancement in all its forms; and as Editor of the 'Cultivator,' however, that Judge Buel will be longest and most favorably known. When he disposed of the Argus establishment, he purchased, much to the surprise of his friends, a tract on the sand plains some two or three miles from Albany, to the improvement of which his first attention and efforts were devoted. This soil was so light, so broken up by clay swamps, and so uneven, that it was considered worthless for the purposes of agriculture, and abandoned to the scanty growth of pitch pines that occupied the surface. As a theorist, Judge Buel thought differently, and the result proved that his reasonings were well founded. He was aware that the sand hills furnished the the means of correcting the clay, and that in the latter a remedy for the lightness and porposity of the former existed. The swamps have been drained, the sand hills leveled, and the whole converted into one of the most fertile and valuable spots in the state. To a skillful rotation of crops Judge Buel owed much of his success; root crops, clover and plaster, corn, and other grains alternating, and all directed with skill as a source of present profit and a permanent amelioration of the soil.

Judge Buel was secretary to the Board of Agriculture at its first establishment, and a most active promoter of the great objects it had in view. It was principally under his direction and supervision that the excellent papers published in the volumes issued by that board were called forth, and those contributed by himself are not among the least valuable in that collection. As President of the present State Agricultural Society, his labors have been unceasing to perfect its more complete organization and efficiency; and to him and some of his worthy associates we owe much that has been done to awaken the attention of the public to agriculture, and particularly to lay the foundation of an agricultural school that should be an honor to the state, and the class it was especially intended to benefit. If all has not been accomplished for the great interests of agriculture that its friends could have wished, the failure cannot be attributed to a want of exertion on the part of Judge Buel. From the first, he has been the firm and unwavering friend of legislative encouragement and appropriations to the aid of agriculture; to the formation of state and county agricultural societies; and its advancement by every means within the power of the state. For six years past, he has been the conductor of the 'Cultivator,' a paper devoted most ardently and efficiently to the cause of agriculture, and which in ability and utility, has had few equals among agricultural papers in any part of the world. It is here, that his loss to the public will be most severely felt.

Judge Buel was a book farmer, in the strictest sense of the term. His knowledge of the business, of its details and management, had been acquired from books and from observation. He was a farmer *cum amore;* because he loved the pursuit, and held it to be the honorable basis of all others. The knowledge he had acquired from books and from reflection, he carried into practice on his farm, with a skill and success that should silence forever the unworthy clamor against the application of science to the advancement of agriculture. He felt his obligations to books, and was never backward in urging upon all, upon whom his influence could be brought to bear the advantage and necessity of a thorough acquaintance with those general principles of agriculture which science and practice have united to develope, and which have been embodied in works devoted to that cause. In no way was his familiarity with those principles and his ability in enforcing and explaining them more conspicuous than in the addresses before various agricultural soci-

eties, both in this state and out of it, to the delivery of which for many years he had been frequently called by those who wished to avail themselves of his ability, knowledge and influence; calls which were rarely declined, except from the most urgent necessity. It was in the performance of a duty of this kind that he was arrested by death while among strangers and far from home.

Few men have passed as public a life as Judge Buel, leaving as stainless and irreproachable a character. Mild in disposition, agreeable in his manners, with a deep sense of moral and religious obligation, it is not strange that he had many friends, and those too among those whose friendship is most valuable. A patriot in the noblest sense of the term, he loved and served his country for his country's sake, above those blighting partizan influences which so often serve to check, arrest or chill, the best aspirations of the heart. It was enough that the state or the nation were to be benefited to secure for any cause his cordial co-operation and support. It is pleasant to dwell on such a character as Judge Buel's but we must close with the remark, that by this death the state has lost one of its most honest and honorable citizens, and agriculture one of its most efficient, able and untiring advocates. Peace to his memory.

SWINE. MAKING PORK.

From the Genesee Farmer.

In a very large part of the United States, next to cultivation of grain, the profits of the farmer are more dependant on his pork than any other single item; and within a few years past the sales of that article, it is believed, have equalled in amount that of any other farm product, wheat excepted. It is becoming, therefore, an object of interest to the country, that the best breeds of swine should be selected and disseminated, and the mostimproved methods of fattening be adopted, as the saving of a single dollar on each porker in rearing or fattening, and experience proves it possible to save many,) would be the saving of millions annually. To these two points, the best breeds and the best mode of fattening, the attention of farmers should be directed.

Fortunately, so far as regards the best breeds of swine, the farmer in the United States has the means of procuring those animals that the common voice of farmers in this country and abroad, have pronounced the best for making pork, and which unite the desired qualities of size, ease of fattening, and fineness of quality. These are the Chinese and the Berkshire; but though the first are superior to all others for quietness, fineness of flesh, and rapidity of fattening, alone they are too small for profitable feeding, and it has been found advisable to cross them with some of the most approved common or imported varieties, in order to give the requisite weight. At the head of these varieties, whether for crossing or for feeding, stand the Berkshire, a breed which if it is of comparatively recent introduction, has, by its valuable qualities, proved itself worthy of a more rapid dissemination than any other breed ever received in this country. That the Berkshire is in equal favor abroad where he is best known, is evident from the following extract which we make from that standard work 'British Husbandry,' and which will also exhibit the principal characteristics of the animal.

"The Berkshire hog is of a reddish brown color with black spots the head well placed, with large ears, generally standing forward, though sometimes hanging over the eyes. He is short legged, small boned, and of a rough curly coat, wearing the appearance of both skin and flesh being of a coarse quality. Nothing, however, can be finer than the bacon, (or pork,) and the animals attain to a very large size, having not uncommonly reached the weight of more than 100 stones; but from 40 to 50, when completely fattened, is the general average. The breed has, indeed, obtained such general approbation from the best judges, that those who wish to improve their stock of swine are very generally desirous of obtaining a cross with that race; and they are consequently dispersed over the most distant parts of the country. Some of the best of these crosses are found in Staffordshire from the progeny of an animal well known to pig breeders as the 'Tamworth Boar.' The native breed is also usually crossed at intervals, either with the pure Chinese or the Tonquin race, and this process is found necessary to prevent deterioration."

To the Berkshire, or to the China crosses, the farmer may therefore look with confidence for the best breeds of swine now in existence; and he who persists in feeding the old fashioned animals, when better are within his reach must find a wide difference between his profits and those of his neighbor, who avails himself of the best animals the country can produce. Hogs weighing eight or ten cwt. have occasionally been produced in this country; but the average weight of our best fatted hogs is much below 400 pounds.

The profits of making pork will depend much on the breed of the animal fed; much on the food used for fattening; and much on the manner in which the process of feeding is conducted. There can be no doubt that some farmers have such inferior pigs, and feed in such a careless and wasteful manner, that they actually lose instead of gaining by attempting to make pork. Almost any hog, and in almost any condition or place, will *improve*, if you give him enough to eat; but to profitably *fatten*, not only must the food be of the right kind and given in a proper manner, but every necessary attention should be paid to the comfort, cleanliness and health of the animal. The time requisite for fattening is of course dependant on circumstances, such as the condition of the pig when put up, the food used, age &c. From eight to twelve weeks may be said to be the shortest time in which hogs can be properly fattened with good care; and under ordinary modes of feeding, they may require a still longer term to be made of good quality; that is, to have the pork firm and the animal well filled with lard. Hogs, when put up for fattening, if well, increase the fastest in weight, and also consume the most food, during the first weeks of their feeding. The rapidity of fattening, and the food eaten, both gradually decrease, but the first lessens most quickly, and after the hog has reached a certain point, his gain will not pay for his feed. When the animal approaches this point, he should be killed. A pig put up to be fattened and regularly weighed, gave the following results, which are conclusive on this point,

and they agree in the main with the experience of every farmer.

Oct. 10.	Weight of pig,	36 st.	7 lbs.				
Oct. 24.	" "	41 "	5 "	gain	38 lbs.		
Nov. 7.	" "	45 "	7 "	"	34 "		
Nov. 21.	" "	47 "	2 "	"	11 "		
Dec. 5.	" "	48 "	7 "	"	13 "		
Dec. 22.	" "	48 "	6 "	"	1 "		

To insure economy in the making of pork, it is indispensable that a suitable piggery be provided. The particular manner in which this building is constructed is of comparatively little consequence, if it unites the essential requisites of such an important part of the farm buildings. It should be convenient; that is, it should be so arranged that the labor of feeding the swine may be diminished as much as possible. At the present time a large portion of the food of hogs is cooked, and the apparatus for cooking and the place of feeding should be near each other. In some of the best arranged piggeries, the furnaces, steamers, kettles, pumps, &c. are under the same roof with the pig stye, and the labor of feeding ten or twenty porkers for eight or ten weeks is materially diminished from what it would be where the cooking is performed in the open air, and at a distance from the pen. The pen for the animals should be so arranged that it can be readily cleaned and kept dry, and in cold weather a bed of straw or litter should be furnished, as no hog can fat well unless he is kept warm and comfortable. Too great a degree of warmth, or too great a degree of cold, seem alike unfavorable to making pork; hence the fall and the spring months are better for this purpose than the summer or winter ones; though in a cool or shaded situation, and on a bare floor, hogs will take on fat as rapidly during the warm months as at any other time. The troughs for feeding must be secured by stanchells, or by pins crossing their upper surface in such a way that all the pigs may obtain their share, and not allow a cross domineering porker to place himself lengthwise in the trough, or run his nose at will from end to end, to the utter discomfiture of the more peaceably inclined. A lid to the trough should be prepared and hung in such a way that the pigs can be shut from the trough, until the food is put in and properly distributed; a thing easily done, and which will prevent a vast deal of squealing and fighting. A farmer should know that it does not sound well, or bespeak, good management, to have his pigs make such a clamor every time he is about to feed them, as to make all the neighborhood acquainted with the important fact. The size of the piggery will of course depend on the number of animals it is intended to fatten; as a general rule about two feet of trough should be allowed to each animal, though a much less space may be made to suffice; especially, if the precaution of dividing the trough into sections has been adopted. Where it is intended to feed a large number, the space or building for the fixtures, (steamers, kettles, &c.) may be made the centre, and the styes arranged around it, so as to make the management of the whole easy. The slovenly manner in which some persons keep their swine, and the disgusting state of their piggeries, especially since the practice of feeding the animals on steamed food has become common, is truly disgraceful, and forms a serious drawback on the profits of feeding, as it is clear that a hog so treated will not take on fat or be as healthy, as one kept as a swine should be.

According to an article in the British Husbandry, a system has been adopted by some of those most extensively engaged in the pork business which appears to be a great improvement on the old method. The styes are built in divisions, each to contain a pig, and to fit him as near as may be. At one end of this bell is the trough, at the other a sliding door that shuts in the pig. No litter of any kind is permitted, as the stalls are on an inclined plane, and cleaned out every day. Holes are bored in the floor to allow all moisture to escape. Some have carried the system so far as not to allow the width of the stall to be sufficient for the hog to turn in, but whether standing or lying, he always remains with his head to the trough. The advantages of this mode are supposed to be, that the hog keeps more quiet; has a clean dry stye, is sure of a sufficient supply of food without fighting for it; and as a necessary consequence fattens much faster. Suppositions which have been justified bythe result of many experiments.

As to the kind of food best adapted to making pork there can be but one opinion where Indian corn is grown. Fed to the swine in the ear, ground or cooked, it is alike superior to all other kinds of food for making pork of the best quality. Various experiments have been made in preparing corn for food. By grinding the cob with the corn a great saving was effected in the quantity of grain used, though the fat did not seem to be taken on quite so rapidly as when fed on pure meal. Cooking the corn, or making it into pudding is probably the best way in which it can be fed, as it is certainly the most economical; giving the bulk necessary for the proper distention of the stomach, with a better development of the nutritive matter than can be obtained in any other way. Making the meal into a mash, with milk or whey, is also a good method of preparing it. In this case it is the better if soured before feeding.

Where corn cannot be grown, the most valuable kinds of food are peas and barley. In England where corn is unknown, the process of fatting is usually conducted as follows. "In order to harden the flesh, and render it of that mellow firmness so essential to fine pork or bacon, some people commence with about two thirds of steamed potatoes, and one third of peas and barley ground in equal proportions into meal, enlarging the quantity of meal as the animal grows fat, by which means it is said that a quick feeder will in twelve weeks consume from 14 to 16 bushels of the grain, and will probably double his weight. One bushel of peas to four of oats, or four of barley, or three or four bushels of potatoes, with two bushels of ground oats and barley boiled, are also considered good mixtures; but nothing in this country is equal to barley meal and white peas—the peas being given whole, and the meal made into a mash with skimmed milk." (See 'Brit. Husbandry') In this country some good farmers consider a mixture of oats in the proportion of one bushel of oats to three or four of corn, so essential, that we have heard them assert that rather than not have the oats for the mixture, they would exchange corn for that grain, bushel for bushel.

For several years past a large proportion of the pork in the northern states, has been mostly made from apples or potatoes, or from a mixture of these,

with meal added for a few of the last weeks of feeding to give the requisite firmness. On apples or potatoes, particularly if steamed, as they always should be, pigs thrive very rapidly, and will in time acquire a very good consistence of flesh as well as weight; but they must be fed for a longer period than when meal is used. Barley has also been extensively cultivated for making pork, as a substitute for corn and peas, and grown for the same purpose by many farmers. Some of the heaviest, finest lots of pork we have ever seen, were made from peas simply prepared by swelling them in tubs with water, and feeding them with milk. As a general rule it may be stated that all food for animals, certainly for fattening ones, should be cooked. In order to thrive rapidly, and take on fat as a hog should, to render making pork profitable, the nutritive matter should be presented in a way that will require little or no expenditure of animal or vital power for its appropriation. The following statement will exhibit at a glance the advantages of so preparing food. "Mr. Walker of Ferrygate, on the 4th of March put up two lots containing five pigs each of the same brood, and two and a half months old. They were separately fed, the one on steamed and the other on raw potatoes, with an allowance of two and a half lbs. of broken barley daily to each lot; the barley for the steamed lot being prepared along with the potatoes. The live weight of the two lots were—

That on raw food,	103
That on steamed food,	106

and the following table exhibits their several improvement:

March 19, pigs on steamed food,	114 lbs.	difference in favor of steamed food 3 lbs.
" " raw "	111	
March 30, weight on steamed food	137 lbs.	do. 13½
" " raw "	123½	
May 1. weight on steamed food,	205	do. 30
" " " raw "	175	
June 1, weight on steamed food,	279	do. 56
" " " raw "	223	

Thus in three months the pigs on steamed food had increased 172 lbs.—being 67 lbs. more than double their original weight while those on raw food only gained 115 pounds. In another instance, two lots were fed on steamed, and on raw potatoes, and in ten weeks the lot fed on steamed food gained 38 stones 6 lbs. and the lot on raw potatoes, 17 stones 11 lbs. making a difference in favor of the steamed food of 360 pounds.

Our experience is also decidedly in favor of steaming or cooking food for swine; but it should not be forgotten, that in order to make profitable pork for cooking, it is indispensable that pigs fed on apples or potatoes should have meal mixed with their food; the quantity to be increased as the feeding approaches its close. With this precaution the general introduction of the plan of fattening swine on steamed apples, or apples and potatoes, or either alone, is one of the greatest improvements of modern farming, adding materially to the profits of the cultivator of the soil, and furnishing a first rate article for the market.

"JOTTINGS DOWN" IN THE SWAMPS.

By the Editor.

No. I.

Blackwater and Chowan rivers, and the mouths of the Roanoke.

Plymouth, N. C. Nov. 19, 1839.

The singular features of the upper Blackwater river, or swamp as it is called above the limit of navigation, have long ago attracted my attention; and more than once I have attempted to induce the landholders on its borders, and the public, to appreciate its neglected *capabilities* for improvement, both for navigation, and for the drainage of the extensive swamp lands on the upper waters.* But it was not until yesterday that I had an opportunity of seeing its now navigable course, and of finding that as remarkable though different features belong to its lower as its upper waters. Even to this time, almost no use is made of this excellent navigable route, except by the small steamboat which runs regularly from the junction of the river with the Portsmouth and Roanoke railway, to Edenton and Plymouth; and this vessel carries little except passengers. That almost no use should be made of this river and also of the Nottoway and Meherrin, for transporting country produce, is owing to the almost closed state of the lower waters and ports of North Carolina, and the consequent low prices which can be there given by merchants.

The Blackwater, from its head spring, which is within two miles of the lowest falls of the Appomattox, is remarkable for its level and sluggish course. It has not a rock, and perhaps not a pebble, in the whole of its long route; and nothing obstructs the passage of its waters, except fallen trees, and the rubbish which has collected above such stoppages. These obstructions have long ago choked up the upper waters for many miles below the head; and have raised the general level of the water, and kept the extensive swamp covered with the impeded water until dried by evaporation; and the acts, as well as the neglect, of the proprietors have been continually operating to render the stream as useless as possible, and to render the swamps irreclaimable, (under our stupid legal policy,) and unproductive of every thing but malaria, sickness, and death. If the law of Virginia had not (effectually though indirectly) forbidden the draining of the swamps of the Blackwater, it might have been done, and 20,000 acres of the richest soil have been made dry and productive, by an expenditure of less money than has been paid in physicians' bills, for the sickness caused by these swamps, and the worthless mill-ponds at the heads of the branches. But this is digressing from my present subject.

At the steamboat landing, and for some miles lower down, the width of this river is sometimes not more than 70, and seldom is 100 feet wide, and this narrow space between the shores is still more lessened by the overhanging branches of the trees which grow thickly on the borders. Then so crooked is the course, and abrupt the turns, and so much are the changes of course shut in and concealed by the sameness of appearance on both sides, that the river presents continually the ap-

* Farmers' Register, p. 532, vol. iv.

pearance, (though a continually changing appearance,) of a little narrow lake. Yet the water is deep enough throughout to float a frigate. Though as black as its name correctly purports, the river was clear of all muddiness. The still and dark waters margined and over-hung by the thick forest growth of the swamps, seemed to belong to the most silent and gloomy solitude of nature; and the contrast was even unpleasant which was presented by the introducing of a thing so noisy and so highly artificial as a steamer in rapid progress.

The entire space between the high-lands is a low swamp, elevated but a few inches above the ordinary height of the river, and of course always wet and miry. The river continually changes from one side of the highland to the other; and therefore it always has swamp land on one side, and generally high land on the other. The character of the swamp was conjectured merely by what was seen from the vessel; but from its little elevation above ordinary or low water, still more than from its being covered by every fresh, I consider it as both irreclaimable and worthless.

Though the leaves had mostly fallen, there were still enough of many kinds of trees and shrubs clothed in their brilliant and varied autumnal tints, to show how much more beautiful this river must be at an earlier season; in May and June especially, when the abundant woodbine and other vines are in blossom, and the dense forest has its richest verdure.

The margin of the river on the swamp side is throughout a dike formed by nature, but so regular as to appear like an ancient construction of art. It is generally above four feet high, and wide enough for a road. Indeed a part of it, of nearly a mile in length, in the lower part of Southampton county, in location happens to suit, and is used as a public road. This natural embankment is obviously the result of the deposite of sediment by the overflowing water, and which here, as on most other streams drops the heaviest and most abundant portion quickest, and of course nearest to the stream. But the wonder here is, that this operation should have been so regular—and by a stream which very seldom has suspended in its water any perceptible earthy matter, and never any of coarse or sandy kind as this is. When this ridge was deposited, the character of the stream must have been very different from what it is now.

There is but little change of appearance in the Blackwater, until it loses its name by junction with the Nottoway, at the North Carolina line. The Meherrin soon after joins also, and the united waters are known as the Chowan. The swamps, which had been more and more taking the place of the high-land margin, were now generally stretched along both sides. And the river rapidly increases in width, until, before joining Albemarle Sound, the Chowan is six miles in width.

All the former *inlets* (as they are called) of the ocean, or rather *outlets* of the rivers and of Albemarle Sound, being now completely shut up by the sand, and the pent-up floods having to seek their difficult passage as far south as Ocracock inlet, the level of the waters has been raised above their former limit. On account of the same separation from the ocean, there is no regular, and scarcely any perceptible tide in the sound, and its water which formerly was salt, is now fresh. There are no better waters in the world for the navigation of vessels of the largest size than the Albemarle Sound and the rivers which flow into it. Yet vessels of no more than five feet draught can now be used on these magnificent waters, because no greater depth can be carried, and that through a long and dangerous passage, to the ocean. The best outlet to a market is through the Dismal Swamp canal, notwithstanding its deficiency of depth and width, and the cost of tolls. One of the most magnificent, and at the same time one of the most useful of public improvements, would be to increase this canal to such size as to admit the passage of ships. Then the great rivers of North Carolina could be put to full use; and at the same time the passage of ships to the ocean would be made as cheap, and far more safe and sure, than if a ship channel could be opened through the wall of shifting sand which binds the coast.

Albemarle Sound, though crossed at the upper and most contracted part, and seen on my passage only by bright moonlight, still appeared a magnificent sheet of water. Our course to Plymouth was up one of the several mouths of the Roanoke, with swamps on both sides still, and more extended and impenetrable than any passed before. These different passages of the Roanoke form several large islands, which are all of low swamp, except small knolls of firm ground which rise a little above the level of the adjoining swamp. One of these islands, Guard Island, in the interior is a jumper swamp, and has bears and rattlesnakes among its inhabitants.

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No. II.

Margin of the great swamp. State of agriculture.

Plymouth, N. C. Nov. 20th.

Yesterday was spent in viewing some of the farms of this neighborhood, embracing some of the richest land in the world, and some, of the poorest and the worst managed. For my guidance, and for the facilities and information without which the observations of a stranger would have been very illy directed, I was indebted to the kind attention of Dr. Armistead, whose farm, two miles from Plymouth, was the most closely examined, though a slighter view was taken of various other properties, within a few miles distance.

Four-fifths of this county, Washington, and perhaps as much of the adjacent counties of Tyrrel, Hyde, and Beaufort—all the extensive peninsula, indeed, formed by Albemarle and Pamlico sounds—is one immense swamp. This whole peninsula, is about 60 miles long, by 40 wide. The part which is not swamp (estimated as one-fifth of the whole,) is composed of the narrow knolls of firm soil which are scattered throughout —islands of sand, or of clay, in a sea of black mire.

I was prepared by my former view of the Dismal Swamp in Virginia, to find this land similar in character, and fully as much of purely vegetable formation as the former. But such is not the fact. I saw one juniper swamp only; and though its under-growth was so thick that I could not penetrate it far enough for examination, no doubt its soil is of the same purely vegetable formation as the juniper lands in Virginia. But with this exception, all the swamp land seen, has been of what is called "cypress and gum swamp;" and which,

judging from the small portion which has been drained and cultivated, is of very great and also very durable fertility. This soil has certainly much vegetable matter; but much of earth also; is about 2 to 2½ feet deep, and resting on a subsoil of what appears to be a tenacious blue clay, when first dug up, but which becomes pulverized by exposure, and forms fertile soil. No doubt the soluble vegetable matter has sunk into this clay, and given to it both its color and its productive power. I never saw any soil that appeared richer than this land, or that promised a greater profit upon the expense of improvement. Still, very few persons have yet begun to drain their swamp lands, and all their cultivation is on the firm knolls, which were never rich, and are now very much reduced by the unceasing cultivation of corn, year after year, which is the general practice of the country. The sole mitigation or change of this course, (if it be either,) is, that peas are always planted among the corn, and the land thus made to bring two crops in each year. But the peas are gathered as well as the corn, and then stock turned in to take all that is left; so that nothing of the crop is given to the land as manure.

The soil of these dry knolls is generally sandy; but sometimes quite stiff. The latter is much the meanest soil of the two, for product, and also the least manageable under cultivation.

The mere observation of the map of North Carolina will show this remarkable peculiarity, that all the numerous streams have their sources in the interior and central parts of the swamps, and thence flow, some in every different direction, to seek lower outlets. This is not only the case as to the great swamp region now under consideration, but also as to the other great swamps which lie south of the Pamlico. This general fact alone would clearly prove that the great body of the swamp land is generally higher than the dry and firm soil which lies without, and through which the swamp streams, which in some cases are large and navigable rivers, seek their passage to the two sounds. It is not meant that the swamps at their edges are higher than the outer firm land immediately adjacent. On the contrary they are lower; but gradually rise towards the interior, and each long and narrow ridge or knoll of firm ground that is reached seems a low step or dike to a higher elevation of swamp within. In my former slight examination of the Dismal Swamp in Virginia, I was struck with, and invited attention to, the like fact of the swamp being higher than *nearly all* the surrounding country, dry, firm and elevated as the latter was. But still there was on one side, (the western,) which I did not visit, higher land, from which streams *might* flow into the swamp, and help to supply the vast superfluity of water, which passed off in every other direction. But even if such is the case in Virginia, (which I now doubt, or suppose at least that the supply of streams from without is of but secondary importance,) it certainly is not so in North Carolina. Whence then can be derived the great supply of water which not only keeps saturated this vast extent of morass, but fills, and keeps full, several lakes of considerable magnitude, and feeds, through all seasons, numerous streams and even deep rivers? Can the rain water alone be sufficient to produce such great results? Or can there be an additional supply from below, in undiscovered and unsuspected springs, and abundant enough in supply for the great effect produced? If reasoning *a priori*, I should have inferred that in a climate as warm as this, and having no more rain, that all the rain that fell on a before dry and level surface, and retained there for want of fall to an outlet, (and therefore to be wasted only by absorption of the earth and evaporation,) could not serve to maintain wetness through all seasons, and consequently could not form a morass. But even if this inference is erroneous, and permanent swamps would be thus formed by rain water alone, retained exactly where it fell, there is yet a much greater and more inexplicable effect produced here, where numerous and large streams are perpetually drawing away the waters of the swamp, and of which moreover the land is so elevated that the rain water may flow *off*, but cannot possibly be increased by flowing *to*, from other lands.

The channels of the streams near where they pass out of the swamps, being deep enough, may well be used to receive the canals, or main-carrier ditches, made to drain the outer parts of the swamps, which are the lowest parts; and to prevent these parts being again flooded from the interior and higher part of the great swamp, some of the numerous long nnd narrow ridges may be used as natural dikes or barriers. The only lands that I saw or heard of in this neighborhood, on which draining had been commenced successfully, were the farms of Dr. Armistead and Mr. Swift; the former being much the more advanced and considerable operation. The proprietor, though with but short experience as a farmer and drainer, and his work therefore necesarily imperfect and insufficient, still has effected a great and admirable change, and which has already been attended with great profit. His main-carrier is upwards of two miles in length, twelve feet wide, and about four feet deep; which depth is not enough by two or three feet, which addition the proprietor designs to give as soon as can be conveniently done. This canal passes through the middle of his swamp land, and serves to drain and to fit for putting to use the whole body of about 500 acres. It empties into a swamp creek. Still, the overflow of water from the interior swamp could cover the head of this canal, and render it incapable of discharging even one-tenth of the supply; but that has been guarded against by a short dike which has been made to unite the adjacent ends of two of the long ridges, and which, thus united, form a perfect defence. But it is enough, and more than it can now do, for the canal to discharge all the water from heavy rains which fall on the area it is designed to draw from. In each of the three last years there has been a storm of rain and wind in August or September, which overflowed the drained swamp, and all its cultivated portion, from two to three feet deep, notwithstanding all the discharge of the canal. This glut of water on such disastrous occasions was no doubt much increased by the wind blowing down the dead trees, and their tops falling into and partially choking the canal. The crop of corn now on the ground, though a very heavy product, offers evidence of the destructive effect of the wind and the flood of last September. The enlarging of the canal, and the entire destruction and removal of the dead trees, will greatly lessen, if not entirely guard against such evils.

The swamp in its natural state is one uniform expanse of the most gigantic and magnificent forest growth; of cypress and blackgum and other aquatic trees mostly, but with some mixture of others more usually found on dry though low land. Vines and shrubs, of various kinds, form the undergrowth. The whole surface of the earth is kept always (unless in winter) under an impenetrable shade. This dense cover of course must much obstruct evaporation, and, when removed for tillage, will greatly lessen the first supply of water to the drains.

The first operation, after digging the main canal, is to kill the trees, which is effectually done by slightly "belting" them, or cutting around through the bark and a little into the wood. Whether this is done in winter or summer, the trees die within one or two years after; and (what was different from my experience and expectation,) no new sprouts grow out from below the belt. Several persons who *intended* to drain, commenced their operations by thus killing the trees. But unfortunately, this was also the *end* of their improvement. In such cases, a new and thick growth of altogether a different kind rapidly covers the land, which if left undisturbed for a few years, would be more difficult to destroy than the original forest. I saw one piece of second growth thus produced. Nearly all the trees were of a species of magnolia, with a very deeply corrugated yet close and firm bark. These beautiful trees were from six to even twelve inches in diameter, with long straight bodies, clear of limbs to a great height; which manner of growth is common to all kinds of trees in the swamp. But if brought under tillage in proper time, the drained swamp land is easy to plough, and to manage and get in good order in all respects, excepting the labor of successive and complete removal of the enormous quantity of large decaying trees.

While the trees are dying, and a year before beginning cultivation, many parallel small cross drains are cut, emptying into larger ones running at right-angles, and these again into the main canal. These small drains are from 100 to 200 yards a part, and are covered. They ought to be dug 3 feet deep, and the wooden covering to be 2½ below the surface. For want of such depth, some have already failed, and have been re-opened for repair. There could be no better subsoil in which to make covered drains, as the bottom is always in the adhesive blue clay. In this a narrower channel is dug, to serve for the pipe, leaving shoulders of the clay, on which, and across the open pipe below, short split boards of heart-cypress, (which is almost imperishable,) are laid. Dr. Armistead thinks that, in addition to the great convenience to cultivation of *covered* compared to *open* ditches, that the former serve even *better* to take in the water by filtration, than the latter do by its flowing in; for so level, and so porous is the soil, that, even when overflowed by a heavy rain, the water scarcely runs at all into ditches, but rapidly disappears by sinking into the earth. But though a strenuous advocate for covered drains where they are suitable, and having had much experience in their construction and of their benefits, I fear that objections to them, though not now suspected, will be found hereafter; and that their present efficacy is owing to what will ultimately cause their filling up and destruction as drains—that is, the ease with which the surface-water finds a passage into them. Wherever water can descend through cavities, it will certainly carry along with it more or less of fine earth; and the little descent in the course of the drains will cause this earth to remain in, and at last choke the pipe. And if such should not be the result, there may be another opposite evil nearly as great. As the vegetable part of the soil shall decay, the texture will become closer, and water cannot, as now, sink into the earth, or through the covering of the drains, and, of course, in the same proportion will the operation of the drains be lessened. Though so much more troublesome during cultivation, I should prefer a smaller number of deep open drains, into which should empty the deep and clean water-furrows of wide and high beds. However—where every thing is so new to me, it is my business to gather and receive, instead of offering to give instruction to others who are better, because more practically informed, as to the peculiarities of this soil. The main canal on Dr. Armistead's land not only needs deepening, but the smaller drains are yet to be dug for much the greater part of the land, which the canal will serve to lay dry. Of more than 500 acres which will be so drained, and for which the most expensive work is done, only 180 acres have been yet made ready for cultivation. From that, (principally, for his highland is of the general mean quality,) he counts on making 1500 barrels of corn; and certainly he has made a most splendid and profitable addition to the previous state of his property. This land is usually estimated, as I was informed, at less than a dollar the acre; and for that price any quantity may now be bought. The draining upon a proper plan and a large scale would be far from expensive; and when drained, the land would be well worth $50 the acre, if the most fertile land in the country is worth that sum. If its durability will be equal to its fertility, it would be cheap at $100 the acre. Yet almost every poor landholder in this county, who is barely feeding his family by the incessant tillage and exhaustion of the poor narrow ridges, also owns of this swamp what would make a princely estate. But it is not only the poor and the ignorant, but the rich and the better informed, who neglect this incalculable source of value. For with the exception of a very few such improvements, (the most important of which I have not yet seen,) the drainage of the swamp lands is either not thought of by proprietors, or considered as among the many visionary schemes of book-farmers.

If drainage were effected even to but slight extent, this region ought to be one of the best for grass husbandry, and for cattle. But the making of hay is not thought of, though so much of the land is so admirably suited to grass. The reeds and other grass of the swamps in their natural state would make most valuable pasturage for cattle; and still better for hogs, with what they would get by rooting. But the bears are so numerous and destructive to both hogs and cattle, that there is little gained by their ranging at large in the swamps. Bears very rarely venture into the cultivated lands; and never leave the swamp unless forced by hunger. Yet so plenty are they in their haunts in the great swamp, that one man in this neighborhood, (of course a great bear-hunter,) killed sixteen in one season, the fall of 1838.

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No. III.

Journey over the firm land of Washington county. First impressions of the great swamp, and Lake Scuppernong.

Somerset Place, Nov. 21.

Having been most kindly invited by Josiah Collins, esq. to accompany him to his place of residence, and promised his aid to enable me to see the swamp lands where I had heard had been made the most successful and interesting improvements by draining, I readily availed of his offer; and this morning we left Plymouth. Our road was necessarily on the only long and nearly continuous stretch of dry land in the county; and was very circuitous. All of the central and southern part of the county, through which a direct route would have led, is part of the great swamp, and of course impassable. The road is on the lower yet firm land near the shore of Albemarle Sound, and for 4 or 5 miles we were with a mile of it, and generally within a quarter of a mile, and in full view of the trees on the opposite side. The water however was but seldom and barely visible, owing to the low level of the road. This firm ground is supposed to be not more than of 10 feet elevation above the water of the sound, and of course is lower than the main body of the great swamp. But whether of the sandy or the clay soil, (as before described,) the land was firm, and the road excellent throughout. Though wider than the smaller ridges, the land generally was of the same kinds and alternations of soil. The swamp growth was often in sight, on one or both sides. After turning southward, from the neighborhood of the sound, we crossed the outer part of Poplar Swamp, a projecting portion of the main body, and which, like that in general, is now covered several inches deep in water, though no rain has recently fallen. Afterwards we passed through a part of what is called the "body land," being the largest body of firm land (7 to 8,000 acres,) and having uniform and peculiar qualities. This is very level, and a close stiff clay soil, which, though firm, requires draining to remove surface water, and without that operation being well executed, the land is worth very little. This draining was not done, or very imperfectly, for a long time; and during that time, the people living on this land supposed that it was not capable of producing them bread. Accordingly, they either cultivated corn on some poor sandy spot in the neighborhood, or bought it with what they gained by cutting lumber, which business was, and still is, the general source of income, here and elsewhere in this county, except the little corn and less wheat cultivated. But since having been sufficiently drained, this "body land" brings good corn, as I saw standing, and very heavy crops of wheat. Some of it has produced 30 bushels of wheat to the acre.

On several of the small farms passed in the day's journey, were seen the Scuppernong grape vines, trained in the manner usual in this part of the country, and on Roanoke Island. One or more vines, (which appeared to be three or four inches in diameter,) rose perpeneicularly about 7 feet, to the top of an open horizontal frame or scaffold, raised on posts, and over which the branches spread, and thickly cover. A single vine will cover, and closely shade a wide space; and as the growth spreads, the frame is extended. The Scuppernong is a native grape. The fruit is white, very large, and grows not in bunches, but singly. It is, to my taste, delicious, and is also a good grape for wine, of which some that is very palatable and much that is bad, is made hereabout.

We crossed Scuppernong river on a draw-brdge. The river is a narrow, but deep, and navigable for sea vessels for a mile above the bridge. It has the same general appearance of all the small rivers of this country, its waters being black and sluggish, spreading far over the low and wide swamp on its borders. Having passed out of this river swamp, our road again rose into high-land or firm soil, and generally under its original high-land forest growth. So far, for more than 30 miles the road had passed through lands as devoid of interest as any whatever. But soon after this, notwithstanding my having been somewhat pre-prepared by previous general description, it was with no less surprise than pleasure that the scene was seen to change, and successive works of industry as well as of nature were successively reached, none of which could have been otherwise suspected of existing in such a locality. The road, while yet on high or dry land, first brought us to the margin of a wide and deep navigable canal, down which the water flowed with a fulness and degree of rapidity which afforded evidence of an unusual rate of descent.

The canal stretched out of sight in a perfectly straight course both above and below, and apparently (as really) for miles in extent. One of its banks had been formed into a wide and excellent road, along which was our still ascending course, meeting the direction of the flow of the water. After proceeding thus, and the land obviously still increasing in elevation, our route rose from a high-land and firm soil to swamp land, having its usual and marked peculiarities. We had indeed just entered the border of the great swamp region, and our course was towards its interior. The land here on both sides was a wet morass, though not inundated, and was principally covered with evergreen trees, so that the verdure of summer was generally presented, when every thing else showed the hues or nakedness of winter. The most numerous and largest of the evergreens are of the same species of magnolia before mentioned, and which is called the black laurel. Some here are more than two feet through the body. It is a beautiful tree, on account of its glossy and bright green leaves, and its long and very straight body; and much more pleasing to the eye were these trees where they formed the almost entire and thick growth.

Next we reached cleared and well drained swamp land, under a heavy crop of corn, of which the growth covered a single field of some 600 acres. The rich soil was quite dry; yet its appearance, as well as the large intersecting ditches, and the yet standing dead trees, all showed clearly enough that it had formerly been swamp of the same character as that on which still grew the native forest of gigantic cypresses, which bounded the prospect beyond the cleared land. A-head of us, and still distant, now were in view various buildings, so numerous as to seem a village. The increased rapidity of the current, as well as the ascending course of the road, which was now manifest to the eye, showed that the land was still

more and more elevated. The mills on the canal, and some other large buildings had narrowed the view ahead; but when these were passed, and the upper termination of the canal nearly reached, its great and magnificent source, Lake Scuppernong, opened gloriously to my view, and a few moments after brought us to its margin. The position of the mansion house barely permits the passage of the road between it and the canal; and the house is also so near the lake, that the spray from its billows in great storms would cover the space between, but for the few cypresses standing in the edge of the water, and other barriers against the violence of the waves.

Across the lake from the canal stretches the great savanna on the opposite shore, and which is scarcely visible, owing to the low size of its general though dense growth. The few scattering high trees thereon, seem to be standing in water, and not on land. The other sides are closed with a dense cypress forest, of the usual great height. In general appearance, at the first glance, this lake is alike to Lake Drummond in the Great Dismal Swamp of Virginia. But the first impressions of both still are very different. Over the latter, it would seem to a stranger that nature reigned in gloomy solitude that had never before been disturbed. With Lake Scuppernong, the works of man stand in strong and conspicuous contrast to the natural scenery and the general condition of the vast and impenetrable morass in which are concealed both this beautiful creation of nature and that of the rare exertion of the industry and intelligence of man; and in a region where these qualities, or their proper direction, seemed scarcely ta be in existence.

Of course, I had been prepared in some measure by previous but very inaccurate report, for the remarkable scene now spread before my view. But if it were possible for a person not so informed to find his way to this spot, by a journey over the only practicable path—and still more if the last few miles were through the intervening trackless swamp, yet remaining in its natural wild state—the *unexpectedness* of the objects found would be even more striking to such an observer than even the actual romantic and peculiar beauties of the scene.

The first discovery and earliest knowledge of this lake was in 1755. Some hunters who had for years dwelt within three miles of its shore, on some of the small "islands" or spots of firm ground, had observed that the deer when pursued, usually ran off in a particular direction, from which the dogs soon returned, as if baffled in their pursuit. Thence it was inferred that some wide water lay that way, in which the deer found a safe refuge. These hunters at last determined to attempt the arduous labor of penetrating the swamp, scarcely passable as it was then even to them, and to find the great water, if it existed within the short distance that they suspected it to be. They set out for this purpose, and worked their slow and toilsome way through the day, and lodged, as well as might be, where night overtook them. The next morning, discouraged by the difficulty of further progress, and fearing to add more to the toil and danger of their return, it was agreed to abandon the adventure forthwith. But before turning their steps homeward, as a lost resource, one of the party, Tarkinton, climbed one of the tallest trees, and from its top, had the first view of the broad waters of the lake, and at no great distance. His joyful exclamations, announcing the discovery, and its direction, induced one of his less zealous companions to try to seize upon the honor of first reaching the lake; and he immediately pushed on in the direction indicated, and had leaped into the water and claimed for it his own name, before Tarkinton could descend the tree and overtake him. Thus was the name of *Phelps* attached to the lake, as contrary to justice, as to euphony and good taste. But in old records it was also sometimes called by the Indian name of Scuppernong, being the source of the river before and still so called; and that name, of better sound and better application, ought by all means to supersede the use of the other.

(To be continued.)

MANAGEMENT BETTER THAN BEATING.

From the American Farmer.

A truckman in Boston, who had a refractory horse, that would not move forward, beat him unmercifully. A gentleman came along, who told him that he must not beat him any more. "What shall I do?" said the man; "my horse has stood here these two hours. Shall I stand here all day?" "Oh no, the horse must go, but you must not beat him any more. Get me a rope twice as long as the horse." The rope was brought, tied to its tail, and then passed between his legs forward; then he gave a pull upon the rope; the horse was frightened, and showed signs of kicking; he continued to pull; the horse suddenly started forward, and went off without any more beating. The gentleman had seen that method tried on jackasses in South America with full success. If you doubt it, try for yourself.

OF THE [ANCIENT] CURRENCY AND VALUATION OF COINS IN VIRGINIA.

From Beverley's History of Virginia.

"The coin which chiefly they have among 'em, is either gold, of the stamp of *Arabia*, or silver and gold of the stamp of the Spanish America: but they have now very little money there, and are still like to have rather less than more, while matters remain in the ill condition they are. For while they are forbid raising the coin, and the neighbouring governments all around, are allow'd to enhance the rate of it with them, to above thirty *per cent*, more than the intrinsick value, all their money will be carry'd thither, which seems to be the greatest hardship in the world, upon that colony. It were much to be wish'd, that all the colonies of the continent under the dominion of *England*, were oblig'd to have one and the same standard for their coin: that so one government might not suffer by the unreasonable advances of another. The inconveniences to *Virginia* by the drawing away all the specie are inexpressible. For people want money for travelling expenses, and for paying the small jobbs of labourers and artificers, who could otherwise have abundance of time to themselves, which is now lost in looking after trivial debts, besides the disadvantage of not

being able to turn the penny. By having no ready money, many law-suits commence to demand those debts, which by this means are contracted, besides the being forc'd to keep a thousand unnecessary accounts."

MONTHLY COMMERCIAL REPORT.

For the Farmers' Register.

The news from Europe to 1st November, is not of a favorable character, and worse tidings are expected by the next steamer, when the accounts of suspension of specie payments in this country shall have been received there. American stocks were at very low rates, and were unsaleable even at the great depreciation which they had reached. The very reduced stock of specie in the Bank of England, although it may not cause a suspension, must render money very scarce, and the probable deficiency in the grain crop is likely to protract the distress which has prevailed for some time past. The inferior quality of the wheat causes prices to be kept down, and consequently enhances the rate of duty—thus rendering the exports from other countries less extensive than they would be if commerce in grain was unrestrained. The price of flour in this country is consequently kept down to the comparatively moderate price of $6¼ to $6½ in the ports of shipment. Wheat $1 15 to $1 25.

A combination of circumstances operates against our great staple, cotton, which the short export from this country is insufficient to counteract. Even the impression which prevailed that another short crop was to succeed the last, was not sufficient to affect prices favorably; and this impression will be removed when later accounts from this country shall be received. The unusually favorable season for maturing the plant and gathering the crop, now gives assurance that the product will be most abundant, and prices are likely to be as low during the ensuing year as in any previous one. The manufacturing interest in the United States is in a very depressed condition, as indeed is almost every other. In the large southern markets the price of cotton has continued to decline until the quotations are reduced to 9 to 11 cents, with prospect of further reduction.

The very limited product of tobacco in 1838 causes the price of that article to be better sustained abroad than of any other; but the abundant crop of the present year will be sufficient to fill all markets, when the period of export shall arrive. The moderate supplies of new crop which now appear at our inspections command a ready sale at $4 to $8.

Our internal exchanges continue in a deranged state. The banks of New York and of the eastern states adhering to specie payments, causes southern funds to be at a discount there of 8 to 12 per cent.; and remittances from one part of the country to another are rendered almost impracticable. Exchange on England during this month has been at 103 to 108 in New York, while in the cities south of it 118 to 120 has been current.

Stocks of every description have fallen to lower rates than at almost any previous time, and the pressure for money never was more severely felt.

X.

November 30th, 1839.

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